PROCEEDINGS

OF THE

American Pharmaceutical Association

AT THE

THIRTY-FIFTH ANNUAL MEETING,

HELD AT CINCINNATI, O., SEPTEMBER, 1887.

ALSO THE

CONSTITUTION, BY-LAWS AND ROLL OF MEMBERS.

PHILADELPHIA:
PUBLISHED BY THE AMERICAN PHARMACEUTICAL ASSOCIATION.
1887.

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1887-88.

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REPORTER ON PROGRESS OF PHARMACY.

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Alabama.	P. C. Candidus, Mobile.
Arkansas.	Jas. E.Gibson, Little Rock.
California.	Emlen Painter, New York.
Connecticut.	C. A. Rapelye, Hartford.
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Ohio.	L. C. Hopp, Cleveland.
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South Carolina.	G. J. Luhn, Charleston.
Tennessee.	J. S. Robinson, Memphis.
Texas.	E. M. Wells, Fort Worth.
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West Virginia.	C. Menkemeller, Wheeling.
Wisconsin.	F. B. Power, Madison.
Ontario.	E. Gregory, Lindsay.
Quebec.	Wm. Ahern, Quebec.

COMMITTEE ON INCORPORATION.

(Appointed by the Chairman of the Council. See also these Proceedings, page 504.)

William S. Thompson (Chairman) . . . . Washington, D. C.
John A. Milburn, Washington, D. C.
Adolph J. Schafhirt, Washington, D. C.

SPECIAL COMMITTEE OF SECTION ON PHARMACEUTICAL LEGISLATION, TO CONSIDER INTERCHANGE OF CERTIFICATES BY STATE BOARDS OF PHARMACY.

Charles W. Day (Chairman) . . . . Springfield, Ill.
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George H. Schafer, Fort Madison, Ia.
George McDonald, Kalamazoo, Mich.
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COUNCIL.

MEMBERS OF THE COUNCIL.

Term expires		
1888.	The Officers of the Association, *ex-officio:*	
"	William H. Rogers	Middletown, N. Y.
"	William Saunders	London, Ont.
"	Albert E. Ebert	Chicago, Ill.
1889.	Philip C. Candidus	Mobile, Ala.
"	George W. Kennedy	Pottsville, Pa.
"	Albert H. Hollister	Madison, Wis.
1890.	James M. Good	St. Louis, Mo.
"	Lewis C. Hopp	Cleveland, O.
"	William Dupont	Detroit, Mich.

OFFICERS OF THE COUNCIL.

William H. Rogers, Chairman, Karl Simmon, Vice-Chairman.
George W. Kennedy, Secretary.

COMMITTEES OF THE COUNCIL.

On Membership: George W. Kennedy, Chairman,
Albert E. Ebert,
Philip C. Candidus,
Alexander K. Finlay,
William Dupont,
The Treasurer and Permanent Secretary of the Association, *ex-officio.*

On Finance: Maurice W. Alexander, Chairman,
James M. Good,
Albert H. Hollister.

On Publication: C. Lewis Diehl, Chairman,
J. U. Lloyd,
Lewis C. Hopp,
Albert E. Ebert,
John M. Maisch.

On Centennial Fund: J. U. Lloyd, Chairman,
Maurice W. Alexander,
John M. Maisch.

LIST OF OFFICERS OF THE ASSOCIATION SINCE ITS ORGANIZATION.

(DECEASED IN ITALICS.)

Date.	Place of Meeting.	Presidents.	First Vice-Presidents.	Second Vice-Presidents.	Third Vice-Presidents.
Oct. 6, 1852	Philadelphia, Pa.	*Daniel B. Smith*, Philadelphia.	*George W. Andrews*, Baltimore.	Samuel M. Colcord, Boston.	*C. Augustus Smith*, Cincinnati.
Aug. 24, 1853	Boston, Mass	William A. Brewer, Boston.	George D. Coggeshall, New York.	*Alexander Duval*, Richmond, Va.	Charles B. Guthrie, Memphis, Tenn.
July 25, 1854	Cincinnati, O	*William B. Chapman*, Cincinnati.	Henry T. Cummings, Portland, Me.	*John Meakim*, New York.	*Joseph Laidley*, Richmond, Va.
Sept. 11, 1855	New York, N. Y.	*John Meakim*, New York.	Charles B. Guthrie, Memphis, Tenn.	*Charles Ellis*, Philadelphia.	*Henry F. Fish*, Waterbury, Conn.
Sept. 9, 1856	Baltimore, Md.	*George W. Andrews*, Baltimore.	*John L. Kidwell*, Washington, D. C.	Frederick Stearns, Detroit, Mich.	*Henry T. Kiersted*, New York.
Sept. 8, 1857	Philadelphia, Pa.	*Charles Ellis*, Philadelphia.	*James Cooke*, Fredericksburg, Va.	*Samuel P. Peck*, Bennington, Vt.	A. E. Richards, Plaquemine, La.
Sept. 14, 1858	Washington, D. C	*John L. Kidwell*, Georgetown, D. C.	Edward R. Squibb, Brooklyn, N. Y.	*James O'Gallagher*, St. Louis.	Robert Battey, Rome, Ga.
Sept. 13, 1859	Boston, Mass	Samuel M. Colcord, Boston.	*William Procter, Jr.*, Philadelphia.	Joseph Roberts, Baltimore.	Edwin O. Gale, Chicago.
Sept. 11, 1860	New York, N. Y.	*Henry T. Kiersted*, New York.	William J. M. Gordon, Cincinnati.	William S. Thompson, Baltimore.	Theodore Metcalf, Boston.
Aug. 27, 1862	Philadelphia, Pa.	*William Procter, Jr.*, Philadelphia.	*John Milhau*, New York.	*Eugene L. Massot*, St. Louis.	J. Faris Moore, Baltimore.
Sept. 8, 1863	Baltimore, Md.	J. Faris Moore, Baltimore.	John M. Maisch, Philadelphia.	Chas. A. Tufts, Dover, N. H.	*George W. Weyman*, Pittsburgh.

LIST OF OFFICERS. (Continued.)

Date.	Place of Meeting.	Presidents.	First Vice-Presidents.	Second Vice-Presidents.	Third Vice-Presidents.
Sept. 21, 1864 .	Cincinnati, O . . .	William J. M. Gordon, Cincinnati.	*Richard H. Stabler,* Alexandria, Va.	Enno Sander, St. Louis.	*Thomas Hollis,* Boston.
Sept. 5, 1865 .	Boston, Mass . . .	*Henry W. Lincoln,* Boston.	George C. Close, Brooklyn, N. Y.	*Elijah W. Sackrider;* Cleveland, O.	Charles A. Heinitsh, Lancaster, Pa.
Aug. 22, 1866 .	Detroit, Mich . . .	Frederick Stearns, Detroit, Mich.	*Edward Parrish,* Philadelphia.	Ezekiel H. Sargent, Chicago.	*John W. Shedden,* New York.
Sept. 10, 1867 .	New York, N. Y. .	*John Milhau,* New York.	Robert J. Brown, Leavenworth, Kan.	N. Hynson Jennings, Baltimore.	*Daniel Henchman,* Boston.
Sept. 8, 1868 .	Philadelphia, Pa . .	*Edward Parrish,* Philadelphia.	*Ferris Bringhurst,* Wilmington, Del.	*Edward S. Wayne,* Cincinnati.	Albert E. Ebert, Chicago.
Sept. 7, 1869 .	Chicago, Ill. . . .	Ezekiel H. Sargent, Chicago.	Ferdinand W. Sennewald, St. Louis.	John H. Pope, New Orleans.	Joel S. Orne, Cambridgeport, Mass.
Sept. 13, 1870 .	Baltimore, Md. . .	*Richard H. Stabler,* Alexandria, Va.	Fleming G. Grieve, Milledgeville, Ga.	James G. Steele, San Francisco.	*Eugene L. Massot,* St. Louis.
Sept. 12, 1871 .	St. Louis, Mo . . .	Enno Sander, St. Louis.	C. Lewis Diehl, Louisville, Ky.	George F. H. Markoe, Boston.	Matthew F. Ash, Jackson, Miss.
Sept. 3, 1872 .	Cleveland, O . . .	Albert E. Ebert, Chicago.	Samuel S. Garrigues, East Saginaw, Mich.	Edward P. Nichols, Newark, N. J.	Henry C. Gaylord, Cleveland, O.
Sept. 16, 1873 .	Richmond, Va. . .	John F. Hancock, Baltimore.	William Saunders, London, Ont.	John T. Buck, Jackson, Miss.	Paul Balluff, New York.
Sept. 8, 1874 .	Louisville, Ky. . .	C. Lewis Diehl, Louisville, Ky.	Joseph Roberts, Baltimore.	William T. Wenzell, San Francisco.	Augustus R. Bayley, Cambridgeport, Mass.
Sept. 7, 1875 .	Boston, Mass . . .	George F. H. Markoe, Boston.	Frederick Hoffmann, New York.	T. Roberts Baker, Richmond, Va.	Christian F. G. Meyer, St. Louis.
Sept. 12, 1876	Philadelphia, Pa . .	Charles Bullock, Philadelphia.	Samuel A. D. Sheppard, Boston.	Gustavus J. Luhn, Charleston, S. C.	Jacob D. Wells, Cincinnati.

Sept. 4, 1877 .	Toronto, Can . . .	William Saunders, London, Ont.	Ewen McIntyre, New York.	John Ingalls, Macon, Ga.	Emlen Painter, San Francisco.
Nov. 26, 1878 .	Atlanta, Ga . . .	Gustavus J. Luhn, Charleston, S. C.	Frederick T. Whiting, Great Barrington, Mass.	Henry J. Rose, Toronto, Can.	*William H. Crawford*, St. Louis.
Sept. 9, 1879 .	Indianapolis, Ind .	George W. Sloan, Indianapolis, Ind.	T. Roberts Baker, Richmond, Va.	Joseph L. Lemberger, Lebanon, Pa.	Philip C. Candidus, Mobile, Ala.
Sept. 14, 1880 .	Saratoga, N. Y . .	James T. Shinn, Philadelphia.	George H. Schafer, Fort Madison, Ia.	William S. Thompson, Washington.	William Simpson, Raleigh, N. C.
Aug. 23, 1881 .	Kansas City, Mo. .	P. Wendover Bedford, New York.	Emlen Painter, San Francisco.	George Leis, Lawrence, Kan.	John F. Judge, Cincinnati.
Sept. 12, 1882 .	Niagara Falls, N. Y.	Charles A. Heinitsh, Lancaster, Pa.	John Ingalls, Macon, Ga.	Louis Dohme, Baltimore.	William B. Blanding, Providence, R. I.
Sept. 11, 1883 .	Washington, D. C .	William S. Thompson, Washington, D. C.	Charles Rice, New York.	Frederick H. Masi, Norfolk, Va.	Edward W. Runyon, San Francisco.
Aug. 26, 1884 .	Milwaukee, Wis . .	John Ingalls, Macon, Ga.	John A. Dadd, Milwaukee, Wis.	Henry Canning, Boston, Mass.	Charles F. Goodman, Omaha, Neb.
Sept. 8, 1885 .	Pittsburgh, Pa . . .	Joseph Roberts, Baltimore, Md.	Albert H. Hollister, Madison, Wis.	Albert B. Prescott, Ann Arbor, Mich.	Joseph S. Evans, West Chester, Pa.
Sept. 7, 1886 .	Providence, R. I. .	Chas. A. Tufts, Dover, N. H.	Henry J. Menninger, Brooklyn, N. Y.	M. W. Alexander, St. Louis, Mo.	Norman A. Kuhn, Omaha, Neb.
Sept. 5, 1887 .	Cincinnati, O . . .	John U. Lloyd, Cincinnati, O.	M. W. Alexander, St. Louis, Mo.	A. K. Finlay, New Orleans, La.	Karl Simmon, St. Paul, Minn.
Sept. 3, 1888 .	Detroit, Mich . . .				

TREASURERS.

Alfred B. Taylor, Philadelphia, 1852–54.
Samuel M. Colcord, Boston, 1854–56, and 1857–59.
James S. Aspinwall, New York, 1856–57.
Ashel Boyden, Boston, 1859–60.
Henry Haviland, New York, 1860–63.
J. Brown Baxley, Baltimore, 1863–65.
Charles A. Tufts, Dover, N. H., 1865–86.
Samuel A. D. Sheppard, Boston, 1886–88.

RECORDING SECRETARIES.

George D. Coggeshall, New York, 1852–53.
Edward Parrish, Philadelphia, 1853–54.
Edward S. Wayne, Cincinnati, 1854–55.
William J. M. Gordon, Cincinnati, 1855–59.
Charles Bullock, Philadelphia, 1859–60.
James T. Shinn, Philadelphia, 1860–62.
Peter W. Bedford, New York, 1862–63.
William Evans, Jr., Philadelphia, 1863–64.
Henry N. Rittenhouse, Philadelphia, 1864–65.
John M. Maisch, Philadelphia, 1865–88.

CORRESPONDING SECRETARIES.

William Procter, Jr., Philadelphia, 1852–53, and 1854–57.
William B. Chapman, Cincinnati, 1853–54.
Edward Parrish, Philadelphia, 1857–58.
Ambrose Smith, Philadelphia, 1858–59.
William Hegeman, New York, 1859–60.
Peter W. Bedford, New York, 1860–62, and 1863–66.
John M. Maisch, Philadelphia, 1862–63.

LOCAL SECRETARIES.

For the meeting held in	
1867	P. Wendover Bedford.
1868	Alfred B. Taylor.
1869	Henry W. Fuller.
1870	J. Faris Moore.
1871	*William H. Crawford.*
1872	Henry C. Gaylord.
1873	Thomas H. Hazard.
1874	Emil Scheffer.
1875	Samuel A. D. Sheppard.
1876	Adolphus W. Miller.
1877	Henry J. Rose.
1878	Jesse W. Rankin.
1879	Eli Lilly.
1880	Charles F. Fish.
1881	William T. Ford.
1882	Hiram E. Griffith.
1883	Charles Becker.
1884	Henry C. Schranck.
1885	George A. Kelly.
1886	William B. Blanding.
1887	George W. Voss.
1888	James Vernor.

REPORTER ON PROGRESS OF PHARMACY.

C. L. Diehl, Louisville, Ky., 1873–88

AUTHORIZED AGENTS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

Appointed by the President in compliance with the following resolutions:

Resolved, That the President be directed to appoint authorized agents, where needed in the different States, for the collection of dues, distribution of the Proceedings, etc.; such agents to be designated by the Treasurer and Permanent Secretary of the Association, and a list of the agents to be published in the Proceedings. (Passed at Baltimore, 1870.)

Resolved, That the President of this Association be requested to appoint, in every locality where more than three members reside, a local agent, whose duty it shall be to aid the Treasurer in the collection of members' dues in his section, and to procure new members by placing before the pharmacists, and others eligible to membership, the great advantages that they will derive from associating themselves with this body. (Passed at Indianapolis, 1879.)

Resolved, That whilst it is desirable that the authorized agents shall at all times render their accounts as promptly as convenient, it is especially to be desired that they render a complete account to the Treasurer of such moneys as are in their hands on the first day of August and December in each year, in order that the Treasurer may be able to make his yearly accounts as full as possible. (Passed by Council, 1883.)

Alabama,	P. C. Candidus, cor. Dauphin and Cedar streets,	Mobile.
Arkansas,	Geo. W. Cabell, Congress and Bull streets,	Hot Springs.
California,	William T. Wenzell, 852 Market street,	San Francisco.
Colorado,	Hugo R. Hartung, 230 Fifteenth street,	Denver.
Dist. of Columbia,	John A. Milburn, 1120 Thirteenth St., N. W.,	Washington.
Connecticut,	John K. Williams, 391 Main street,	Hartford.
	Warren A. Spalding, 19 Church street,	New Haven.
	Luzerne I. Munson, Apothecaries' Hall,	Waterbury.
Delaware,	Linton Smith, cor. Seventh and Market streets,	Wilmington.
Georgia,	Theo. Schumann, Whitehall and Hunter streets,	Atlanta.
	Robert H. Land, 270 Broad street,	Augusta.
	John Ingalls, cor. Fourth and Poplar streets,	Macon.
Illinois,	E. H. Sargent, 125 State street,	Chicago.
	David G. Plummer, 6 Main street,	Bradford.
Indiana,	Albert B. Buck,	Anderson.
	Henry J. Schlæpfer, Second and Main streets,	Evansville.
	George W. Sloan, 304 North Meridian street,	Indianapolis.
	David Hilt, 84 Main street,	Lafayette.
	William C. Buntin, 600 Main street,	Terre Haute.

Iowa,	John W. Ballard, 106 West Second street,	Davenport.
	Theodore W. Ruete, 379 Main street,	Dubuque.
	George H. Schafer, 129 Front street,	Fort Madison.
	Silas H. Moore, 80 Fourth street,	Sioux City.
Kansas,	George Leis, 90 Massachusetts street,	Lawrence.
	Robert J. Brown, 113 Delaware street,	Leavenworth.
Kentucky,	C. Lewis Diehl, cor. Third and Broadway,	Louisville.
	William H. Averill, 435 Main street,	Frankfort.
Louisiana,	Isaac L. Lyons, 42 Camp street,	New Orleans.
	Joseph T. Thibodeaux, Main street,	Thibodaux.
Maine,	Noah S. Harlow, 4 Smith's Block,	Bangor.
	Edmund Dana, Jr., 373 Congress street,	Portland.
Maryland,	Henry A. Elliott, 286 Lexington street,	Baltimore.
	Thomas W. Shryer, 103 Baltimore street,	Cumberland.
Massachusetts,	George M. Hoyt, 257 Columbus avenue,	Boston.
	Joel S. Orne, 493 Main street,	Cambridgeport.
	B. Frank Stacey, 51 Vine street,	Charlestown.
	Frederick T. Whiting, Main street,	Great Barrington.
	Freeman H. Butler, 141 Central street,	Lowell.
	Joseph W. Colcord, 153 Union street,	Lynn.
	Samuel O. Daniels, Main and Summer streets,	Natick.
	James E. Blake, 65 North Second street,	New Bedford.
	Joseph J. Estes, Union and Church streets,	Rockland.
	Thomas B. Nichols, 159 Essex street,	Salem.
	William Bush, 56 Front street,	Worcester,
Michigan,	Ottmar Eberbach, 12 South Main street,	Ann Arbor.
	Theodore Ronnefeld, 195 Gratiot street,	Detroit.
	Henry Melchers, Genesee and Jefferson street,	East Saginaw.
Minnesota,	Karl Simmon, Third and Market streets,	St. Paul.
Mississippi,	Joseph W. Eckford, Commerce street,	Aberdeen.
	Matthew F. Ash,	Jackson.
Missouri,	William T. Ford, 1305 Cherry street,	Kansas Ctiy.
	James M. Good, 2348 Olive street,	St. Louis.
Nebraska,	Charles F. Goodman, 180 Farnham street,	Omaha.
Nevada,	William A. Perkins. 213 Main street,	Virginia City.
New Hampshire,	Bayard T. Perry, 1088 Elm street,	Manchester.
	E. S. Russell, 69 Main street,	Nashua.
	Joseph H. Thacher, 12 Market street,	Portsmouth.
New Jersey,	Albert P. Brown, cor. Fifth and Federal sts.,	Camden.
	Jonathan B. Drake, 132 Broad street,	Elizabeth.
	Hermann Klussmann, Fourth street and Lafayette avenue,	Hoboken.
	Maxwell Abernethy, 188 Newark avenue,	Jersey City.
	Charles B. Smith, 831 Broad street,	Newark.
	Robert E. Parsons, 19 Main street,	Orange.
	Howard P. Reynolds, Front and Cherry sts.,	Plainfield.
New York,	Charles H. Gaus, 202 Washington avenue,	Albany.
	G. C. Close, 67 Cumberland street,	Brooklyn.
	Charles O. Rano, 1872 Niagara street,	Buffalo.
	William L. Dubois, 281 Main street,	Catskill.
	James T. King, cor. Main and South streets,	Middletown.

New York,	Daniel C. Robbins, 91 Fulton street,	New York.
	G. H. Haass, 38 Main street,	Rochester.
	John G. Bissell, 45 Dominick street,	Rome.
	Charles F. Fish, 114 Broadway,	Saratoga.
	Willis T. Hanson, 195 State street,	Schenectady.
	Charles W. Snow, 28 East Genesee street,	Syracuse.
	William Blaikie, 202 Genesee street,	Utica.
North Carolina,	William Simpson, 33 Fayetteville street,	Raleigh.
	John H. Harding, 124 South Front street,	Wilmington.
Ohio,	Andrew M. Armstrong, 106 East Market street,	Akron.
	Walter H. Howson, Water street,	Chillicothe.
	J. U. Lloyd, Court and Plum streets,	Cincinnati.
	George L. Hechler, 1099 Broadway street,	Cleveland.
	Charles Huston, 43 South High street,	Columbus.
	Thomas J. Casper, 41 East Main street,	Springfield.
	Charles Hohley, 248 South street,	Toledo.
	Edgar M. Hatton, Fifth and Main streets,	Zanesville.
Pennsylvania,	Jacob A. Miller, cor. Second and Chestnut streets,	Harrisburg.
	Charles A. Heinitsh, 16 East King street,	Lancaster.
	Joseph L. Lemberger, 8 North Ninth street,	Lebanon.
	Francis W. Walker, Jr.,	New Brighton.
	Rich. M. Shoemaker, cor. Fourth and Race streets,	Philadelphia.
	James B. Cherry, 23 Fourth avenue,	Pittsburgh.
	Philip M. Ziegler, 526 Penn street,	Reading.
	Edward A. Cornell, Tenth and Pine streets,	Williamsport.
Rhode Island,	James H. Taylor, 104 Thomas street,	Newport.
	Wm. K. Reynolds, 254 Friendship street,	Providence.
South Carolina,	Gustavus J. Luhn, Post-office Box No. 582,	Charleston.
Tennessee,	Jas. S. Robinson, cor. Third and Madison streets,	Memphis.
	John C. Wharton, 38 Union street,	Nashville.
Texas,	Thomas W. Powell, 10 Houston street,	Fort Worth.
Virginia,	Frederick H. Masi, cor. Main and Granby,	Norfolk.
	T. Roberts Baker, 919 East Main street,	Richmond.
West Virginia,	Edwin L. Boggs, Kanawha Bank Building,	Charleston.
	Edmund Bocking, 1 Odd Fellows' Hall,	Wheeling.
Wisconsin,	John R. Drake, 365 South Water street,	Milwaukee.
Prov. Nova Scotia,	Francis C. Simson,	Halifax.
Prov. Ontario,	John Lowden, 18 DeBreseles street,	Toronto.
Prov. Quebec,	Henry R. Gray, 144 St. Lawrence Main street.	Montreal.

LIST OF QUERIES.

THIRTY-SIXTH ANNUAL MEETING, TO BE HELD IN DETROIT, MICH., SEPTEMBER, 1888.

Attention is directed to the CENTENNIAL FUND, the interest of which is to be used for defraying the expenses of suitable investigations (see Chap. VII. of By-Laws of the Council). Those desiring to avail themselves of this fund, may make application to the Permanent Secretary.

To encourage investigations, the "EBERT PRIZE" is offered "for the best essay or written contribution containing AN ORIGINAL INVESTIGATION OF A MEDICINAL SUBSTANCE, determining new properties, or containing other meritorious contributions to knowledge; or for IMPROVED METHODS of determined merit, for the preparation of chemical or pharmacal products; provided, that in case no one of the essays offered is of sufficient merit to justify the award, in the judgment of the Committee on Prize Essays, all may be rejected, and the sum added to that of the Fund" (see Proceedings 1873, page 58).

The following resolutions were passed in 1887 (see Proceedings 1887, p. 505):

Resolved, That the Association award annually three prizes for the three most practical papers read before the Scientific Section, aggregating the sum of $150, and apportioned as follows: $75 for the first, $50 for the second, and $25 for the third prize. The awards to consist of funds, apparatus, chemical or pharmacal literature, the choice to be optional with the winners; all essays or papers to be marked on title page, "For competition," so as to separate them from volunteer papers not offered in competition. And further

Resolved, That a committee of five be appointed, who shall decide upon the relative merits of such papers.

1. It is said that a wild licorice grows in some sections of the South. Information in regard to it is desirable, both as to its botanical classification and the amount of glycyrrhizin it contains.

Accepted by D. S. Carraway, Chattanooga, Tenn.

2. Experimental determinations are desired of the relative alkaloidal strength of fluid extracts prepared from fresh and from dried drugs.

3. There is a crystalline deposit in the tincture and in the fluid extract of eupatorium purpureum. What is it?

Accepted by Joseph Jacobs, Atlanta, Ga.

4. May capsules either of cacao butter or of gelatin, charged with the required medicament, be substituted for suppositories when the latter are prescribed by the physician?

5. What per cent. of extract does the tincture of nux vomica found in the shops contain?

Accepted by L. C. Hogan.

6. A rapid and accurate method for estimating glycerin in fluid extracts is desired.

7. Is precipitated sulphate of iron of constant composition? Does it contain the same proportion of water of crystallization as the large crystals?

8. A paper is desired on prescription pharmacy.
Accepted by H. Serodino, Cincinnati.

9. To what extent can wood spirit be substituted in pharmacy for ethylic alcohol?

10. To what uses connected with pharmacy can acetone be put?

11. What is the quality of commercial balsam Peru?

12. What is the composition of commercial calcium lactophosphate?

13. Can Fowler's solution be made more stable? What precautions as to exposure to light, access of air, etc., should be taken to preserve it?

14. What is the nature of the acid which forms in tincture and fluid extract of belladonna soon after being made, and is it produced at the expense of the atropine?

15. Is it advisable at the next revision of the Pharmacopœia to fix standards of alkaloidal strength for any galenical preparations?

16. Should the "abstracts" be retained in our Pharmacopœia?

17. Which of the pharmacopœial extracts can be prepared of standard strength in powdered form?

18. Do the powdered extracts of commerce coincide in strength with the corresponding "solid" extracts? What ones, if any, should be altogether condemned?

19. What is the quality of the powdered extract of ergot of commerce?

20. A practical formula is wanted for the preparation, economically, of pure mercurous iodide (yellow).

21. Certain physicians declare that preparations made from dried gelsemium are greatly inferior to those from the green root. Do facts sustain this assertion?

22. Dr. Weld has shown that tincture of chloride of iron, when diluted with *water*, acts very energetically on the teeth. In what vehicle can it be prescribed so as to have a minimum of injurious effect?

23. Polygonum aviculare—common knot-grass—is said to contain a considerable quantity of alkaloid. Has it active medicinal or toxic properties?

24. What is the comparative medicinal activity of Indian and American cannabis?

25. What substitutes are now offered in commerce for male fern?

26. What is the quality of the powdered extract of cannabis indica of commerce?

27. As catechu, the U. S. P. directs the extract of Acacia Catechu; the Br. P. uses the extracts of Uncaria Gambir. Which of these two is to be preferred?

28. Why should not the names of manufacturers be given in connection with analyses of their products?

29. In the light of the investigations of Kobert, what modifications should be made in the pharmacopœial formulas for preparations of ergot?

30. Experimental evidence is desired regarding the truth of Kobert's conclusions concerning the active principle of ergot.

31. A maximum dose list is desired for incorporation in our Pharmacopœia.

32. What is the quality of the pills of protiodide of mercury of the market?

33. What power has filter paper for depriving alkaloidal solutions of alkaloids?

34. What is the yellow compound produced by the reaction of silver nitrate with Mayer's reagent?

35. An improved formula for a fluid extract of ipecac is desired.

36. To what is the deep green color of certain extracts and fluid extracts due?

37. Practical formulæ are desired for "triturates."

38. Cannot the U. S. P. formula for soap liniment be improved?

39. Is there any good reason for retaining in the U. S. P. both ferri pyrophosphas and ferri phosphas?

40. What wines are best adapted to meet the requirements of the U. S. P. under the names of white wine and red wine?

41. A practical method of estimating the medicinal value of digitalis, and of its preparations is desired.

42. To what extent is peanut oil manufactured in the United States? To what uses can it be advantageously applied in pharmacy?

T. Roberts Baker,
A. B. Lyons,
J. M. Good.
Committee on Scientific Papers.

SUBJECTS ASSIGNED FOR CONSIDERATION AT THE MEETING OF 1888.

Section on Commercial Interests.

Resolved, That the American Pharmaceutical Association request manufacturers and dealers to label their products in conformity with the official nomenclature, and to designate strengths by the specific gravity or percentage strength, abolishing arbitrary signs and obsolete standards, such as "F" marks and Beaumé.

Section on Pharmaceutical Legislation.

1. Should the diplomas of Colleges of Pharmacy entitle holders to registration without examination?

2. Give an outline of a pharmacy law embodying all desirable features.

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Appendix.

PREFATORY NOTICE.

The different portions of the manuscript for the present volume were promptly forwarded to the Permanent Secretary, and arrangements were made with the printer as soon as the number of copies to be printed could be decided upon with some degree of probability as to the number actually required. Although some unpleasant delays occurred, the publication of the volume has been effected at about the same time as last year. To accomplish this it became necessary to ask the consent of the Council to omit from the present volume the reprint of the "National Formulary," which had been ordered by the Association; and this consent was given, as will be seen by reference to page 647. A separate volume of the "Formulary" will be sent to every member entitled, when ready for delivery.

The Chairman of the Committee on the Drug Market having been absent in Europe at the time when the report of that Committee was printed, several clerical errors could not be corrected in print, and attention is, for this reason, here drawn to the following misleading errata:

Page	382	line	15	from	top	for	100 cases	read	600 cases.
"	"		8	"	bottom	"	tons	"	pounds.
"	385		13	"	"	"	30 cents	"	80 cents.
"	389		18	"	"	"	$2.35	"	$2.85.
"	"		11	"	"	"	1886	"	1886–1887.
"	393		24	"	top	"	38.98 gallons	"	3998 gallons.

The prices of the several issues of the Proceedings now on hand, *including postage*, are:

	Unbound.	Bound.
1851, 1852, 1853, 1854, 1855, each	$0 25	
1857,	50	$0 75
1858,	1 50	1 75
1859,		1 75
1860,		1 25
1862, 1863, each		1 50
1864, 1865, 1866, each	1 50	1 80
1867,	2 20	2 50
1868, 1869, 1870, each	2 50	3 00
1871,	4 50	5 00
1872,	2 50	3 00
1873, 1874, each	5 00	5 50

1875, 1876, each	$7 00	$7 50
1877, ...	6 00	6 50
1878, 1879, each	7 00	7 50
1880, ...	6 00	6 50
1881, ...	5 50	6 00
1882, ...	6 00	6 50
1883, ...	5 00	5 50
1884, 1885, 1886, 1887, each	5 50	6 00

1856 out of print; none published in 1861.

The Publishing Committee offer the Proceedings from 1851 to the present time in sets of five or more volumes, at the following prices, *exclusive of postage or express charges:*

For any	5	volumes	a discount of	20	per cent,	on the	above prices
"	10	"	"	30	"	"	"
"	20	"	"	40	"	"	"
"	30	"	"	50	"	"	"
For the entire set			"	60	"	"	"

All orders for Proceedings should be addressed to the Permanent Secretary, John M. Maisch, 143 North Tenth street, Philadelphia, Pa.

The price of the nickel badge has been reduced by vote of the Council to 25 cents, on receipt of which sum by the Permanent Secretary the badge will be sent by mail.

The thirty-sixth annual meeting will be held in the city of Detroit, Mich., on the first Monday (third day) of September 1888, at 3 o'clock p. m. Blank forms for recommendations for membership may be obtained from the Permanent Secretary or from the Committee on Membership. Such recommendations should reach the Chairman of the Committee, George W. Kennedy, Pottsville, Pa., on or before August 25th; if sent later they should be addressed to the care of the Local Secretary, James Vernor, Detroit.

REPORT

ON THE

PROGRESS OF PHARMACY.

FROM JULY 1, 1886, TO JUNE 30, 1887.

BY C. LEWIS DIEHL.

Among the many subjects that have engaged the attention of thoughtful pharmacists during the past few years, none have done so more than the solution of the problem how to combat most successfully the constantly increasing demand for medicinal agents and appliances of special manufacture. In his previous report your reporter has rarely alluded to this subject, believing with many others that time, the great healer of all ailments, would also heal the wounds that were being thus inflicted. But the time has arrived when this subject can no longer be ignored in a review of the periodic progress made in pharmacy: the numerous papers on this subject during the past year—some of them by the most conservative and accomplished writers on pharmaceutical topics—bearing ample testimony to their necessity.

Small causes are often recognized only by the magnitude of their effects. In a large cave in the southern portion of Indiana, after having traversed a dismal and uninteresting passage for miles, the visitor's journey ends upon a rocky mountain, crowned by an immense alabaster pillar, some thirty feet in height by forty feet in circumference, and uniting the apex of the mountain with the dome of the chamber enclosing it. On one side of this remarkable column large masses of alabaster have been removed in pre-historic times, leaving a spacious ledge, several feet in height, upon which a small pool of drinkable water has been formed by water rapidly dropping from above. By the side of this pool, removed from it only by a few inches, a slender stalagmite, not more than two or three inches in height, is in process of formation: a single drop of water, holding saline substances in solution, falling upon it at regular and comparatively long intervals, and thus constantly, though imperceptibly, increasing the size of the miniature stalagmite. We are thus brought face to face with the very action that produced the mighty stalacto-stalagmite, and though ages were consumed in, and probably since, its formation, we are perfectly certain that the formation of the giant has been due to precisely the same causes as those that have produced the pigmy.

And just as we can recognize the effect of these drops of saturated salt solution, so we can recognize the effect of the introduction—by drops as it were—of the medicinal agents that are in a fair way to overwhelm the older and well tried remedial agents, and to revolutionize the entire method of medication. If this revolution was, as is claimed by those most actively engaged in bringing it about, a necessity occasioned by the failure of the older remedies to combat disease, it would not meet with the opposition it does, but would be welcomed by progressive pharmacists as well as physicians everywhere. But their use appears to be largely prompted by convenience, and it is a very common experience that when absolute effects are imperatively demanded, physicians promptly resort to the older, more simple, and well tried remedies. In point of fact, the introduction and use of most of these specialties is based upon false premises, false representations, and false conclusions: false premises, in that the claim is put forth that certain absolute conditions as to purity, quality, or combination are attainable only, or best, in the particular form of the preparation recommended; false representations, in that the preparation recommended varies in one particular or another from the composition claimed, or that it can be secured in proper condition only by the special care and skill of the particular manufacturers; false conclusions, in that the effects supposed to have been obtained with the preparation are assumed from the results of superficial experiment or experience, and may be due to other causes.

Twenty-five or thirty years ago, when your reporter first entered the drug business, the specialty business was in its infancy. There were at that period only a few such preparations in demand by prescribers. Nevertheless, these have served as the types, and may be regarded as the foundation upon which the present fabric of pharmaceutical specialties has been built. But mark the difference; that while formulas and working processes were given as a rule for the special preparations of that day, in the case of the immensely increased number of the present, the formulas are either not given at all, or they are worded so vaguely that it amounts virtually to the same thing. This whole subject is so familiar to pharmacists that particulars need not be brought forward here. The fact remains that physicians everywhere are led, mainly by skillful advertisement, to prescribe the special preparations of individual manufacturers—be they pills, extracts, syrups, elixirs, or nondescripts—to the exclusion, more and more, of the preparations of the Pharmacopœia, or of such having public formulæ and universally acknowledged merit. If their attention is drawn to the incongruous composition of a particular specialty, the answer, as likely as not, will be that they care not what the composition may be so "good results" are obtained. The question, so pertinently asked by a medical writer recently, when commenting upon the custom of physicians to recommend new remedies by the stereotype expression, "I have obtained good results with this preparation," may be as pertinently asked here: "What is meant by good results?"

What the future of pharmacy will be has puzzled the wisest minds of the profession. Just as the development of manufacturing facilities has taken the preparation of chemicals from the hands of pharmacists, so will eventually the manufacture of galenical preparations that require more than ordinary attention be taken away. The tendency of specialty manufacture, however, is to take away the last foothold of pharmacy—compounding—and it is against this innovation more than any other, that the so-called "old-school" pharmacists are violently opposed, carrying their opposition, unwisely perhaps, to all that accompanies it.

The argument is sometimes advanced that the manufacturers of these specialties are entitled to whatever extra profit they reap, because they have originated the particular preparation. This "originality" does not bear very close inspection, however; for shrewd men, particularly if aided by capital, find no difficulty to appropriate the products emanating from the brain of their more simple-minded and more conscientious fellow-men. Looking over the entire field, it may be asked, how many of these preparations are really original with their producers? In the most favorable instances they are merely happy combinations of the ideas and results worked out by men who, devoted to science, communicate their results for the common good and for the advancement of their profession. In most cases, however, it is the outright appropriation of the labor of others, who may be either less favorably situated to profit by their labor, or who lay too little value upon the result of their researches. It is against these pirates upon legitimate pharmacy that our opposition should be concentrated; and while all progressive pharmacists are prepared to admit the utility of presenting medicines in the most palatable and acceptable form, their efforts should be rigidly directed towards sweeping from the field of medicaments all those sailing under a trade-mark, or for which an absolute working formula is withheld.

The report which is herewith submitted will, it is believed, give a comprehensive review of the papers on pharmacy and kindred subjects that have been communicated to the American and foreign journals during the past year. An attempt has also been made to give a synopsis of the titles of the more important reports and papers read at the meetings of the State Pharmaceutical Associations, but it must be remarked that at this date the reporter has been enabled to consult only four printed reports, and that, with this exception, and written communications from the Secretaries of two State Associations, he has been compelled to rely upon the more or less imperfect reports of these meetings contained in different pharmaceutical journals. The arrangement, instead of being, as heretofore, in the chronological order of the meetings, has been changed to an alphabetical arrangement of the titles of the Associations, and is believed to be more convenient for reference.

Alabama Pharmaceutical Association.—The sixth annual meeting was held in Mobile, May 10th and 11th, 1887. Members in attendance: a quorum. New members elected, 19. Present membership, 102.

Routine business and the pharmacy law engaged the attention of that Association mainly.

The next meeting will be held at Selma, on the second Tuesday in May, 1888.

Arkansas State Pharmaceutical Association.—The fourth annual meeting was held in Little Rock, June 1st to 3d, 1887.

Discussions.—1. On pharmaceutical legislation, and the co-operation of the State Medical Society to secure a pharmacy law.

Papers.—Several were read.

The next annual meeting will be held at the place and time of the meeting of the State Medical Society.

Connecticut Pharmaceutical Association.—The eleventh annual meeting was held in Meriden, February 1st and 2d, 1887.

Reports.—Several were presented.

Papers.—Several were read.

The next meeting will be held at Willimantic, February 7, 1888.

South Dakota Pharmaceutical Association.—A meeting for organization was held at Mitchell, October 20, 1886. It is intended that this Association shall embrace the druggists and pharmacists south of the 46th parallel.

The first annual meeting will be held at Sioux Falls, on the Tuesday following the first Monday in September, 1887.

Delaware State Medical Association.—A meeting was held in Wilmington, May 12, 1887. The annual meetings will be held on the first Thursday in May. The place for the next meeting will be announced after further consultation.

Florida State Pharmaceutical Association.—This association was organized at Jacksonville, June 8, 1887.

The first annual meeting will be held at Tallahassee on the second Tuesday of May, 1888.

Georgia Pharmaceutical Association.—The twelfth annual meeting was held on Cumberland Island, April 12, 1887.

Discussions.—The establishment of a College of Pharmacy in connection with the new School of Technology in Atlanta.

Papers.—Several were read.

The next meeting will be held at Atlanta, July 10, 1888.

Illinois Pharmaceutical Association.—A special meeting was held in

Springfield, January 13 and 14, 1887, with the view of considering amendments to the Pharmacy law.

Indiana Pharmaceutical Association.—The sixth annual meeting was held in Richmond, June 7 and 8, 1887.

Papers.—A number were read.

The next meeting will be held at Fort Wayne.

Iowa State Pharmaceutical Association.—The eighth annual meeting was held in Waterloo, May 11 and 12, 1887.

Discussions.—The liquor law of the State and its effect upon legitimate pharmacy.

Papers.—(1) On "Preparations Made by Pharmacists." (2) On "Ointment of Oxide of Zinc." (3) On the deficiency in strength claimed for certain "Elixirs of Berberine."

The next meeting will be held at Des Moines, May 2, 1888.

Kansas Pharmaceutical Association.—The eighth annual meeting was held in Wichita, June 8 and 9, 1887.

Papers.—Several were read.

The next meeting will be held at Abilene, May 17, 1888.

Kentucky Pharmaceutical Association.—The tenth annual meeting was held in Louisville, May 18 and 19, 1887. Members in attendance, 175. New members elected, 150. Present membership, ——.

Papers.—"(1) What are the Benefits to be Derived from Membership in the Kentucky Pharmaceutical Association? (2) Changes in the Drug Business before and since the War. (3) A Review of 800 Prescriptions. (4) On Aromatic Syrup of Rhubarb. (5) On Crab Orchard Salts. (6) Where are we Drifting? (7) On Recovery of Alcohol. (8) On Spirit of Hydriodic Acid. (9) On Elixir of Gentian with Chloride of Iron."

The next meeting will be held in Henderson, May 9, 1888.

Louisiana State Pharmaceutical Association.—The fifth annual meeting was held in New Orleans, April 13 and 14, 1887. Members in attendance, 23. New members elected, 5. Present membership, 133.

Reports.—(1) On Trade Interests. (2) On Pharmacy and Queries. (3) On Adulteration and Deterioration of Drugs.

Papers.—"(1) Outlines of a plan for the Establishment of a School of Pharmacy in the City of New Orleans. (2) Note on Tobacco. (3) Louisiana Indigenous Plants (two papers). (4) On Syrupus Ferri Oxydati Solubilis."

Massachusetts State Pharmaceutical Association.—The sixth annual meeting was held in Holyoke, June 7 to 9, 1887.

Reports.—(1) On Trade Interests. (2) On Legislation.

Papers.—"(1) Advance in Pharmacy for the Year. (2) Use of Corrosive Sublimate as an Antiseptic. (3) Examination of Prescriptions as to

Use of Pharmacopœial and other Preparations. (4) Notes on Menthol and Culture of the Plant. (5) Oil of Camphor.

A special meeting will be held in Boston in January, 1888, when the time and place for the next annual meeting will be decided upon.

Michigan State Pharmaceutical Association.—The fourth annual meeting was held in the city of Grand Rapids, October 12th to 14th, 1886. Members in attendance 187; new members elected 97; present membership 787.

Reports.—(1) On Formulary. (2) On Legislation. (3) On School of Pharmacy of Michigan University. (4) Of Michigan Board of Pharmacy.

Papers.—(1) Commercial "Aromatic Sulphuric Acid." (2) Commercial quality of "Iodoform." (3) On "Plants Indigenous to Ann Arbor" (three papers). (4) On "Fluid Extract of Ergot." (5) On oxidized mercury in "Mercury with Chalk." (6) On use of "Mayer's Reagent" in estimating alkaloids. (7) On "Weights and Measures of U. S. P. 1890." (8) On the "U. S. P. Method of Assaying Opium" (two papers). (9) Plan of "Reading for Assistants in Pharmacy." (10) Natural *vs.* artificial "Salicylic Acid." (11) Quality of "Citrate of Caffeine." (12) "Caffeine" in different brands of coffee. (13) Alkaloidal valuation of "Veratrum Viride." (14) Standardizing of "Solid Extracts."

The next meeting will be held at Petoskey, on the second Tuesday in July, 1887.

Minnesota State Pharmaceutical Association.—The third annual meeting was held in New Ulm, June 14th and 15th, 1887. Members in attendance, about 60; new members elected, 20; present membership, 225.

Papers: (1) Which brand of "Saccharated Pepsin" is best adapted for the preparation of "Liquor Pepsini." (2) On the preparation of "Liquor Ammoniæ Acetatis." (3) A plan to prevent the "Adulteration and Sophistication of Medicines."

The next meeting will be held at Stillwater, on the second Tuesday in June, 1888.

Mississippi State Pharmaceutical Association.—The fourth annual meeting was held in Jackson, May 17, 1887. The next meeting will be held at Meridian, May 15, 1888.

Missouri State Pharmaceutical Association.—The ninth annual meeting was held at Sweet Springs, June 28–30, 1887. Members in attendance, about 250. New members elected, some 185. Present membership about 850.

Reports.—(1) On National Formulary.

Papers.—(1) "How can We Make our Association Meetings More Profitable?" (2) "Some Statistical Accounts of the State Pharmaceutical Associations." (3) "Morphine Percentage of 52 Samples of Powdered Opium." (4) "On the Quality of Some Pharmaceutical Preparations of the market." (5) "On the Syrups of Rhubarb." (6) "On Parts by Weight." (7) "The Commercial Traveller." (8) "Miscellaneous Notes." (9) "The Quality of Powdered Gum Arabic."

The next meeting will be held at Sweet Springs, June 12, 1888.

Nebraska State Pharmaceutical Association.—The sixth annual meeting was held in Omaha, May 10th to 12th, 1887. New members elected, 120. Present membership, over 500.

Reports.—Besides routine reports, one on "Pharmacy Law."

Papers.—(1) "On Pharmaceutical Education." (2) "On Commercial Pressed Herbs."

The next meeting will be held at Lincoln, May 8, 1888.

New Hampshire Pharmaceutical Association.—The thirteenth annual meeting was held in Manchester, September 14, 1886.

Reports.—(1) On Unofficinal Formulas. (2) On the Progress of Pharmacy.

The next meeting will be held at ———, on the fourth Tuesday in January, 1887.

New Jersey Pharmaceutical Association.—The seventeenth annual meeting was held in Patterson, May 25–26, 1887.

Papers.—(1) "The Special Provisions of Nature in Fertilizing Flowers." (2) "The Medicinal Plants that are Indigenous to New Jersey." (3) On "Syrups." (4) "The Influence of Free Trade on Abolition of Custom Duties on Drugs and Chemicals." (5) "Pharmaceutical Morals." (6) "The Sale of Liquors as a Beverage by Pharmacists." (7) "A Dissertation on Botany." (8) "The Field for a Pharmacist as an Analyst." (9) "Toxical Analysis." (10) "Home-made Pharmaceuticals."

The next meeting will be held at Morristown, May 23, 1888.

New York State Pharmaceutical Association.—The ninth annual meeting was held at the Thousand Island Park, June 21 to 23, 1887. Members in attendance, 69; new members elected, 70; present membership, 810.

Reports.—(1) On Adulteration. (2) On Legislation. (3) Pharmacy Board Appointments. (4) On Pharmacy and Queries. (5) On Unofficinal Formulæ.

Papers.—(1) On "Parts by Measure." (2) On "Syrup of Hydriodic Acid." (3) On "Upright Condensers." (4) On the "Action of Boric Acid on Microbes." (5) On "Ice Water *vs.* Distilled Water" for Pharmaceutical Uses. (6) On "Extract of Vanilla." (7) On "Relative Business Relations."

The next meeting will be held at Catskill, on the third Tuesday in June, 1888.

North Carolina Pharmaceutical Association.—The seventh annual meeting was held in Fayetteville, August 11 and 12, 1886.

Resolutions.—(1) Favoring the election of the Board of Pharmacy by the Association. (2) Favoring that the financial affairs of the Board of Pharmacy be placed into the treasury of the Association. (3) Favoring a rebate by the government on alcohol used in medicine or the arts. (4) Favoring the abolition of the special tax as liquor dealers on druggists who sell alcohol only.

Papers.—(1) A formula for "Elixir of Pyrophosphate of Iron, Quinine and Strychnine." (2) Assay of different samples of "Fowler's Solution."

The next meeting will be held in Asheville, on the first Wednesday of August, 1887.

Ohio State Pharmaceutical Association.—The ninth annual meeting was held in Akron, June 8 and 9, 1887.

Papers.—(1) Sulphate of Morphine. (2) Black Oxide of Manganese. (3) Pressed Herbs. (4) The Handwriting on the Wall. (5) Solution of Ferric Citrate. (6) The Quality of Commercial Powdered Opium. (7) The Amount of Resin in Commercial Jalap. Several other papers were read.

The next annual meeting will be held at Columbus, June 13, 1888.

Pennsylvania Pharmaceutical Association.—The Tenth Annual meeting was held in Philadelphia, June 14th to 17th, 1887. Members in attendance, 162. New members elected, 122. Present membership, 625.

Reports.—(1) Committee on Legislation. (2) Committee on County Societies. (3) Committee on Adulterations.

Papers.—(1) A commercial and dangerous mixture of conium fruit in "Italian Anise." (2) Non-pharmaceutical use of the "Microscope" in the drug store to accommodate. (3) What is the quality of "Lupulin" found in the market? (4) Is the present officinal formula for "Syrup of Lime" sufficiently practicable, and is the product satisfactory? (5) "Water," its uses and abuses in pharmacy. (6) The "Pharmacist," wise and otherwise. (7) Does the present formula for "Ammonia Liniment" produce a satisfactory preparation? If not, what changes are necessary to make it so? (8) How can this "Association" make practical the important suggestions made in the papers? for instance: how can we influence the elimination from the Pharmacopœia of the long list of officinals that are never called for? (9) An examination of the "Castile Soaps" of the market. (10) The "Peppermint Industry." (11) What necessity exists for the "Enormous Profits" charged pharmacists by manufacturers of chemicals and wholesale druggists for glass and other containers? (13) What are the uses of "Benzine and the Lighter Petroleum Products" in pharmacy? (14) "Our Customers," their places and how to treat them. (15) "Jalap Resin and Jalapin." (16) "Carmine Solutions." (17) "Medicated Plasters" with rubber bases. (18) What advantage would be gained by extending the system now officinal for fluid extracts to all the "Liquid Preparations of the Pharmacopœia," that is to substitute the gram and cubic centimeter for parts by weight? (19) "Hydrometer Scales." (20) The "Responsibility of Proprietors" for the careless or non-labelling of any package dispensed.

The next meeting will be held at Titusville, on the second Tuesday in June, 1888.

Rhode Island Pharmaceutical Association.—The twelfth annual meeting was held in Providence, January 12th, 1887.

Reports: Among others one respecting the attendance, etc., at a course of lectures on chemistry, given under the auspices of the Association.

The next annual meeting will be held ———.

Tennessee Pharmaceutical Association.—A meeting for organization was held at Nashville, and a constitution and by-laws adopted.

Resolutions.—(1) To contest before the Supreme Court a decision of Chancellor Manet respecting the "Liquor License" that druggists are required to pay. (2) Respecting a modification of the "Special Merchants' License Act" of 1882, to relieve druggists who confine themselves to the sale of liquor for medicinal purposes.

The first annual meeting will be held at Nashville.

Texas State Pharmaceutical Association.—The eighth annual meeting was held in Fort Worth, May 10th to 12th, 1887.

The next meeting will be held in Austin, May 8th, 1888.

Virginia State Pharmaceutical Association.—The sixth annual meeting was held in Richmond, May 10th to 12th, 1887.

The next meeting will be held in Danville, May 1st, 1888.

West Virginia Pharmaceutical Association.—The seventh annual meeting was held in Grafton, June 8th, 1887.

The next meeting will be held at Clarksburg, June 19th, 1888.

Wisconsin Pharmaceutical Association.—The seventh annual meeting was held in Fond du Lac, August 9th to 11th, 1886.

Reports.—(1) On Trade Interests. (2) On Adulteration. (3) On Unofficinal Formulas.

Papers.—(1) On "Elix. of Iron Pyrophosphate, Quinine and Strychnine." (2) On "Quillaya as a substitute for Senega."

The next meeting will be held at Milwaukee, on the second Tuesday in August, 1887.

PHARMACY.

A. Apparatus and Manipulations.

WEIGHTS AND MEASURES.

Measures of Weight and Volume.—Dr. A. B. Lyons has written an interesting report upon the Measures of Weight and Volume, absolute and proportional, to be recommended for the next Pharmacopœia. He reviews the various systems that have been in use and that have been proposed, and in particular criticises the sweeping change that has been made at the last revision of our Pharmacopœia. "Since, however, the principle of basing all formulas on parts by weight has been adopted, and has brought our Pharmacopœia in a measure into harmony with those of continental Europe, and at any rate facilitates comparisons with their formulas, it would be unwise to go back to the principles which we perhaps unwisely abandoned."—Pharm. Era, Feb. 1887, 38–41; from Proc. Michigan Pharm. Assoc., 1886.

Parts by Measure.—In reply to the query whether there should be a return to the plan of determining the final products in the fluid preparations of the Pharmacopœia by measure instead of by weight, Mr. Clay W. Holmes reports that, after a consideration of the subject in all its bearings, the present plan is well founded, and that a return to parts by measure must be deemed as retrograde.—Proc. N. Y. State Pharm. Assoc., 1887, 172–173.

PERCOLATION AND EXTRACTION.

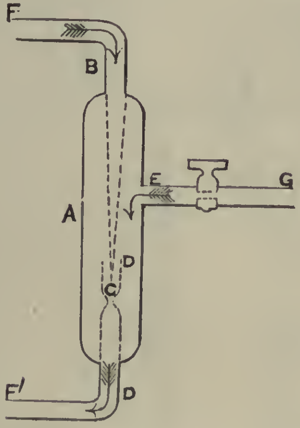
Percolation.—Mr. H. W. Snow has read a paper on percolation, detailing the results of comprehensive study, before the Detroit Pharmaceutical Society, Dec. 1886, which he has communicated to "Pharm. Rec." (Jan. 1887, 6–9). The paper is accompanied by several illustrations, and will be read with interest and profit.

Referring to Mr. Snow's paper, Mr. Edwin S. Anderson makes some remarks respecting the proper proportions for a percolator, which are mainly a criticism of that gentleman's view on this point. See *Ibid.* Feb. 5, 1887, 53.

Mr. W. H. Allen makes some remarks on the same subject, particularly in reference to Mr. Anderson's criticism. See *Ibid.* March 1, 1887, 66.

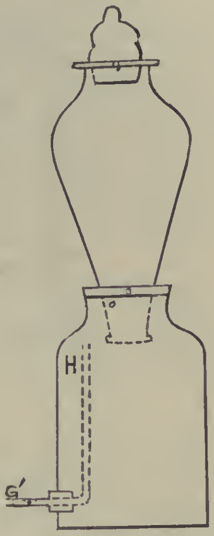
Percolation under Pressure—Simple Method.—Mr. Thomas Maben describes the apparatus shown by Figs. 1 and 2, which has been successfully employed by him to hasten the process of percolation, and is well adapted to pharmaceutical purposes. It consists of a vacuum pump, made of brass throughout, and of an ordinary York Glass Company percolator, which can be made air-tight at will. The pump is constructed as follows: *A* is a tube about 3½ inches long, and ¾ inch diameter, into which is soldered a small tube, *B*, the upper part of which may be conveniently bent to a right angle. This tube is gradually narrowed to the orifice, *C*, which is inserted about half an inch into the outlet tube, *D*. This tube, which is also soldered to *A*, may be cylindrical, but is preferably constricted about an inch below *C*. A connection having been made by means of india-rubber tubing between the main hydrant and *F*, the water is forced through *C*, and in passing into the outlet tube it rapidly creates a vacuum, and *A* is rapidly exhausted, the air being drawn through the annular space at *D*. A tube may be attached to *F′*, if necessary, to carry off the effluent water. The inlet tube for admission of air is attached laterally at *E*, and is provided with a stop-cock, and when this is opened the air rushes into *A*, a continuous current being drawn through *D* to the outlet. In this way a stronger or weaker current of air may be produced, varying according to the pressure of water. The top being removed from the receiver of the percolator, a cork is inserted through which passes a glass tube, *G′H*, bent at right angles. A small valve is fitted to *G′*, which admits of the air passing freely through in the direction of the arrow, but prevents water flowing backwards, should there be any tendency in that direction. A tube, which must be of stout rubber, or preferably with a coil of wire inside, connects *G* and *G′*, and the apparatus is complete. A vacuum-gauge to indicate the degree of

FIG. 1.



Vacuum Pump.

FIG. 2.

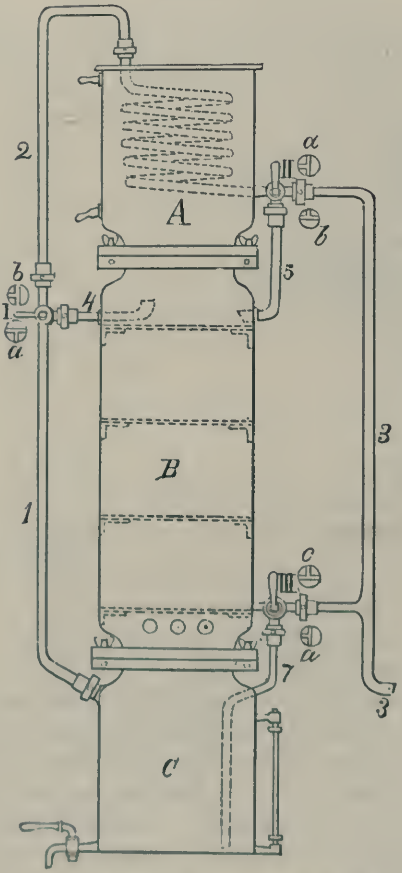


Percolator for Vacuum Pump Attachment.

exhaustion, can easily be fitted on at *E*.—Pharm. Jour. and Trans., May 21, 1887, 941–942.

A New Extraction Apparatus—Construction and Uses.—Prof. L. Lewin has devised the extraction apparatus shown by Fig. 3, which is intended for the following pharmaceutical operations: (1) Continual extraction with hot menstrua. (2) Continual extraction with cooled menstrua. (3) Recovery of the menstrua from the finished extract by direct distillation. The apparatus is composed of three easily separable principal parts: *C*, the tinned copper still; *B*, the copper percolator, the bottom of which does not rest directly upon the still—a hollow chamber, communicating with the outer air through openings, as shown in the cut, intervening. The percolator is provided with three movable sieve bot-

FIG. 3.



Lewin's Extraction Apparatus.

toms for the reception of the substance to be extracted. The bottom, which is slightly inclined, closes the recipient for the percolate, and is kept cool by the hollow space beneath. *A* is the cooler. The whole apparatus is supported by a substantial tripod. For the

Continuous Extraction with Hot Solvents, the vapors pass from the still *C* in the tube *1* and enter through the tri-faucet *I* when in position *a* through tube *4* into the percolator *B*, penetrate the substance to be extracted, and condense. The percolate passes into the receiver and from this flows through the tri-faucet *III* in its position *a* through the tube *7* again into the still, to repeat this course as long as may be necessary or desirable. To prevent pressure in the apparatus, the tube *2* is removed during this operation, and the tri-faucet *II* is placed in position *a*. This admits the vapor into the cooling worm *A*, which thus forms a safety-valve. For the

Continuous Extraction with Cooled Solvents, the vapors pass from the still *C* into the tube *1* and enter through the tri-faucet *I* in its position *b* through tube *2* into the cooling-worm *A*, from this as liquid through the tri-faucet *II* in its position *a* into the percolator, and so through the substance to be extracted into the still as before. For the

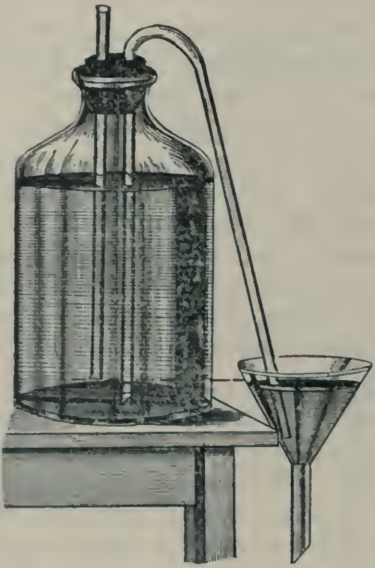
Recovery of the Solvent from the Extract by Direct Distillation, the vapors pass from the still *C* through tube *1*, through the tri-faucet *I* in its position *b*, through tube *2* into the cooler *A*, through the tri-faucet *II* in its position *b* into the exit tube *3*, which latter may be lengthened at pleasure.

Portions of the percolate may be removed from the receiver at pleasure through the tri-faucet *III* in its position *c* by the tubes *2* and *3*. All of the tubes are readily connected or disconnected by good screw-joints. —Arch. d. Pharm., Jan., 1887, 74–77.

FILTRATION, ETC.

Automatic Filtration—Simple Method.—Dr. O. Billeter describes a simple contrivance for the purpose of automatic filtration, which is shown by the accompanying cut (Fig. 4), and which, though it has long been in use in various modifications, deserves to be used more frequently than it appears to be. The liquid is put into a bottle which is closed by a twice-perforated cork. Into one opening a siphon is inserted, the outer arm of which is not much longer than the inner one, and ends in the funnel. A straight tube open at both ends is inserted through the second opening, and its lower end is placed on a level with the height of the liquid to be reached in the funnel. The siphon is filled by carefully blowing through the straight tube, after which filtration proceeds without further attention. Obviously the liquid may be heated or the funnel connected with a vacuum pump.—Chem. Ztg., 1887, 509.

FIG. 4.

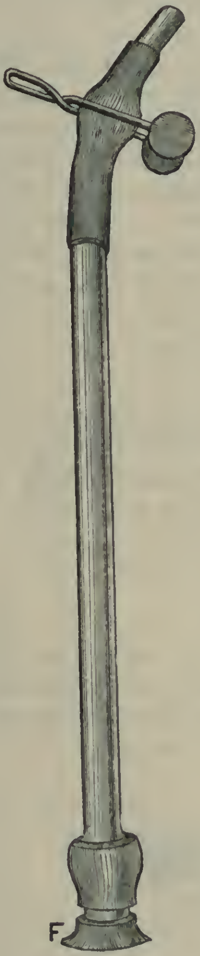


Apparatus for Automatic Filtration.

Filter Tube.—Construction for Alkaloid Estimation with Mayer's Reagent.—Mr. F. C. J. Bird describes a modification of a filter tube, originally designed by Mr. A. W. Blyth (Analyst, VI, 162) for operating with Mayer's reagent in estimating alkaloids, which is shown by the accompanying cuts (Fig. 5 and 6). It is made in the following manner.

A piece of glass tubing of about three-sixteenths is heated and compressed near one end until its diameter is increased by about one-half; the enlarged portion is then drawn out to a point like a pipette. The other end is filled with a piece of stout rubber tubing, a burette clamp, and a short glass tube to serve as a mouth-piece. One end of another piece of glass tubing is then enlarged to the shape of a small funnel, and cut off at about three-quarters of an inch from the enlarged end. A circle of the filtering medium, consisting of thick filter paper placed between two pieces of fine muslin, is placed over the mouth of the funnel, turned down all round, and secured in position by slipping over the whole a piece of stout rubber tubing three-eighths of an inch in length. To the stem of the funnel another piece of rubber tubing is connected, leaving about three-quarters of an inch projecting, and the pipette portion having been inserted, the instrument is complete. Before use the filtering medium must be prepared by mixing a little finely powdered French chalk with water, and having immersed in the mixture the end (*F*) of the filter-tube, sucking at the mouth until the filtrate passes through perfectly clear. When, however, a liquid containing a precipitate from Mayer's reagent is being filtered, it will be found that considerable force is required to draw the liquor through, and the operation becomes very fatiguing. The clamp is intended to obviate this, for having sucked the air out of the tube as completely as possible, the clamp is closed, and the liquid gradually rises of its own accord into the vacuum existing inside the tube. The pipette may then be disconnected from the filter, and by compressing the rubber tubing between the finger and thumb at the point between the clamp and the top of the long glass tube, a drop of clear filtrate may be forced out into a watch-glass, and

FIG. 5.



Filter Tube.

FIG. 6.

Section of Filter.

tested with a drop of Mayer's reagent; then by opening the clamp, the remainder of the liquid flows back into the bulk which is being estimated. It is always advisable that the liquid filter into the pipette to the height of 2 or 3 inches, so that all traces of the preceding filtrate may be washed through, and a representative sample obtained.—Pharm. Jour. and Trans., April 9, 1887, 826.

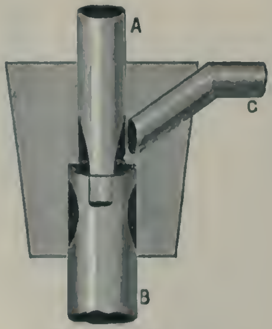
Talc Filters—Construction.—According to Chem. Ztg. (1887, No. 7), filtration by the aid of talc has proven very useful. Finely powdered white talc is digested with hot water, acidulated with hydrochloric acid, and, after complete washing with pure water, dried. The so prepared dry powder is added to turbid liquids, which are then filtered in the usual manner, producing rapidly clear filtrates. Or a double filter being made of filter paper, this is placed in a funnel, and a mixture of talc and water, shaken well so as to be uniform, is poured on in such manner that when the water has completely drained the filter is evenly covered with the talcum.—Arch. d. Pharm., April 1887, 309.

Filter Paper—Necessity to Test for Sulphate of Calcium.—Mr. Padé observes that filter paper is so often adulterated with sulphate of calcium that analysts should test it carefully. Paper weighing 13.2 gm. gave, when incinerated, 1.374 gm. of solids, constituted chiefly of the lime. A discovery of the fact led to a modification of the official statements concerning the adulteration of wines in France.—Amer. Jour. Pharm., June 1887, 296; from Jour. de Pharm et de Chim., 1887.

APPLICATION OF HEAT, ETC.

Apparatus for Vacuum Distillation—Cheap Construction.—Prof. J. N. Hurty describes the following apparatus for vacuum distillation, which is cheaply and quickly constructed: A good sized rubber stopper, one inch in diameter at the big end, is bored one-half its length with an ordinary cork borer, three-eighths of an inch in diameter. From the shoulder where this bore ends, the hole is continued clear through with a smaller

FIG. 7.

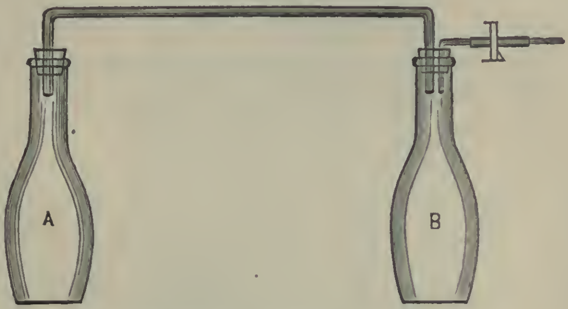


Vacuum Pump.

borer, one-fourth inch in diameter. Now, from the side of the stopper is bored diagonally a hole three-sixteenths of an inch in diameter. This hole must terminate at the shoulder, formed in the center by the other two bores. Into this lateral bore is inserted a piece of glass tubing slightly drawn out, with both ends properly rounded in the flame. Into the other bores are also inserted short glass tubes of proper diameter to fit tightly. The tube entering the smaller bore must be drawn out so as to project at least one-quarter of an inch into the larger tube, below which it is constricted. The arrangement is shown in the cut. Over each of these tubes is drawn rubber tubing of proper size. Water from any convenient source is made to enter through *A*, suction is immediately created at *C*, the water flowing out at *B*. The rubber tube attached to *C* is connected with any vessel in which it is desired to produce a vacuum.

A practical apparatus for the recovery of alcohol from fluid extracts, tinctures, etc., is shown by Fig. 8. It consists of two flasks joined by a glass tube of suitable bore. After the introduction into *A* of the liquid from which the alcohol is to be distilled, the air is exhausted to a twenty-inch vacuum. *A* is then immersed in a water or oil-bath and *B* in ice water. All joints must be perfectly tight, and the vacuum once established, the pinch-cock may be applied and the pump disconnected. Upon the application of heat at *A* the distillation proceeds rapidly and smoothly without danger of burning the extract or losing alcohol.—West. Drugg., June 1887, 185–186; from Proc. Indiana Pharm. Assoc., 1887.

FIG. 8.

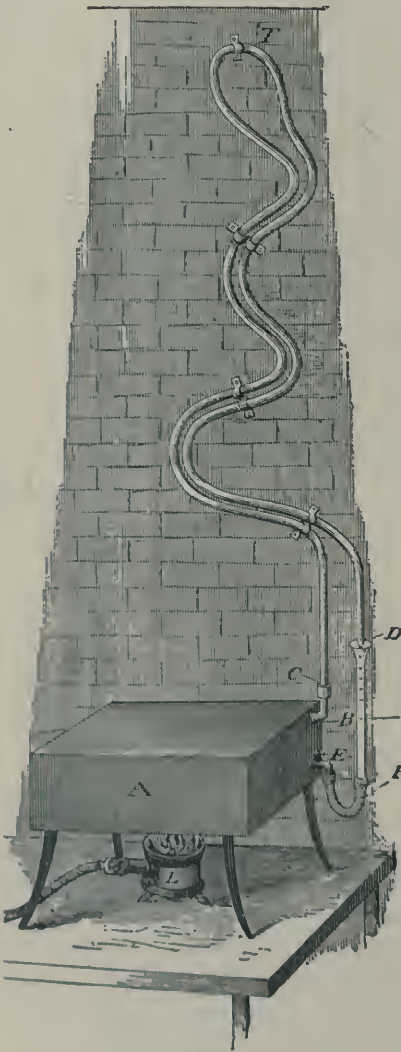


Apparatus for Vacuum Distillation.

Upright Condenser.—Mr. Luther F. Stevens describes the method of constructing an upright condenser cheaply from a lamp-chimney, corks (soaked in shellac solution), and glass tubing. Such a condenser, together with the apparatus in connection with which it is employed, is shown in a cut illustrating the author's paper. The author also discusses different applications of the apparatus.—See Proceedings N. Y. State Pharm. Assoc., 1887, 175–177.

Constant Water-Bath—New Construction.—Prof. B. F. Davenport describes the form of water-bath shown by the accompanying cut (Fig. 9).

FIG. 9.



Constant Water-Bath.

It consists of the square box *A*, supported over a Fletcher's solid-flame burner. The top of the box, 15x15.5 inches, is formed by a brass-plate, ¼ inch thick, which thus is stiff enough to support a considerable weight without yielding, the sides and bottom being sheet-copper. From the point *B* projects a ½ inch brass tube, *BC*, which turns up at a right angle. At *E* is a stop-cock, which is connected by a thick rubber tube with the glass tube *DF*, which is fastened against the adjoining wall. Connected with *C* by a rubber-joint, is a ½ inch block-tin tube of 20 feet length, which extends up the wall in the manner shown to the highest point *T*, and thence returns and ends just over the slightly funnel-shaped top of the glass tube at *D*. The bath being filled with water to just the level *Bb*, it may be kept at constant boiling for many days without appreciable loss of water, the steam being condensed in its passage up, or if uncondensed before it reaches the point *T*, in its passage down the block-tin tube. In flat-bottom platinum or porcelain capsules evaporation goes on very rapidly when placed on top of this water-bath.—Pharm. Rundschau, March 1887, 61.

Drying Oven—Improved Construction.—Mr. Charles Rice describes a drying oven of improved construction. It has the usual shape of the laboratory drying oven, is constructed of stout sheet copper, has double walls on all sides (even the door having double walls, but the space is here filled with asbestos), and the parallel sheets forming each side are held together by carefully placed rivets, which serve at the same time to prevent the sides from bulging when steam is used. For the detailed description, which is accompanied by two cuts, reference must be had to the author's paper in Amer. Drugg., August 1886, 141–142.

MISCELLANEOUS SUBJECTS.

U. S. Pharmacopœia—Criticism of Some Methods and Preparations.—Mr. Hance M. Wilder criticises some of the directions of the U. S. Pharmacopœia, as well as some of the preparations. His criticisms embrace the menstrua, temperature, recovery of alcohol, distilled and ordinary water, abstracts, sulphurous acid, chartæ, spiritus, and precision of language, for all of which reference must be had to the original paper in Drugg. Circ., July 1886, 147.

Nitrometer—Simple Construction.—Mr. Thos. P. Blunt gives the following simple directions for constructing at short notice an inexpensive nitrometer: Two glass syringe tubes, of ½ oz. and 1 oz. capacity respectively, have their points connected by a piece of black feeding-bottle tube, on which is placed a pinch such as is used for burettes. This is the nitrometer, which is completed by graduating the smaller of the tubes by pouring first one-half and then one drachm of water into it and marking each level by a file scratch, whilst the larger tube is provided with eleven marks, each of one drachm, ascertained in the same manner. The method of using the apparatus is as follows: The larger tube is placed in a vessel of brine deep enough to reach the neck; the clip is released until the tube is completely filled, with the aid of suction, when the clip is again adjusted, and any liquid sucked into the upper and smaller tube is turned out. The upper tube is now filled to the 1½ drachm mark with the spirit of nitrous ether to be examined, the clip is released, and the whole lifted out of the vessel of brine until the spirit of nitre has reached the one-half drachm mark, indicating that one drachm has been introduced into the lower tube. The excess is poured out of the upper tube, which is rinsed, and solutions of potassium iodide and dilute sulphuric acid are introduced successively into the lower tube in precisely the same way. Then, after moving the lower tube gently up and down once or twice, it is raised until the level of the fluid within and without it is equal, and the volume of gas is read off.—Pharm. Jour. and Trans., March 19, 1887, 763.

Vulcanized Rubber — Cause of Change.—Vulcanized rubber instruments undergo chemical changes which in a few months render them useless. They become roughened, and white spots and patches appear, which gradually extend into the substance of the articles. Mr. Ballaud attributes the changes to a very gradual production of sulphuric acid by means of the moisture in the air uniting with the sulphur contained in the rubber, and, in a previous note, indicated the quantity given off in a chemical analysis in which these instruments were used. The action of the acid upon the instruments can be neutralized by occasional washings with water made slightly alkaline. Drainage tubes treated in this way, five or six times a year, will preserve their elasticity and color. He has remarked the length of time laboratory tubes will last when used as siphons.—Amer. Jour. Pharm., June 1887, 296; from Jour. de Pharm. et de Chim., 1887.

B. PREPARATIONS.

ACIDA.

Aromatic Sulphuric Acid—Variation in Percentage of Sulphuric Acid.—Mr. E. W. Clark has determined the amount of sulphuric acid in five samples of aromatic sulphuric acid. He prepared some in strict conformity with the pharmacopœial directions, and found that 36.18 cc. of volumetric solution of soda were required to neutralize 9.8 grams of the product, this indicating a little less than 20 per cent. of sulphuric acid, the Pharmacopœia giving 36 cc. as corresponding to 20 per cent. None of the samples came up to the officinal standard. They contained respectively 13.86, 14.32, 18.03, 14.00, and 19 36 per cent. of sulphuric acid. No attempt seems to have been made to ascertain in how far the formation of ethyl sulphuric acid may be concerned in the results obtained with the commercial sample.—Pharm. Era, March 1887, 69; from Proc. Mich. Pharm. Assoc., 1886.

Eau de Rabel, Fr. Cod.—Etherification.—Mr. T. Gautrand has studied the etherification of this preparation of the French codex (a mixture of 1 part oil of vitriol with 3 parts alcohol, colored by the addition of 1 p. c. of red poppy leaves), under various conditions, by determining volumetrically the total amount of free acid as H_2SO_4, and gravimetrically the total sulphuric acid, after decomposing the sulphovinic acid by evaporation and ignition with pure potassium nitrate; the difference between the two determinations indicates the H_2SO_4 (½) present as sulphovinic acid. He found that the limit of etherification in this preparation corresponded in neutralizing effect to 7.2 per cent. H_2SO_4, or to the formation of 18.5 per cent. of sulphovinic acid. The main factor affecting the rapidity of the change is the temperature, the limit being reached in summer in about two months, in winter in more than four months, and at 83° C., the boiling point of the mixture, in less than half an hour. Direct sunlight and the coloring matter do not influence the limit nor the rapidity of the change. In the course of several years a retrograde change takes place, the sulphovinic acid being partly decomposed. Mixtures of equal weights of sulphuric acid attain in six days the limit of change, corresponding to 12.1 per cent. H_2SO_4 in neutralizing power. A mixture of 1 part of sulphuric acid and 5 parts of alcohol forms in about ten months sulphovinic acid corresponding in neutralizing power to 5 per per cent. H_2SO_4.—Amer. Jour. Pharm., June 1887, 292–293; from the Author's Thesis.

Eau de Rabel—Value as a Solvent for Quinine, etc.—Mr. Carles states that Eau de Rabel has a more agreeable taste, is borne better by the stomach, and is a better solvent for quinine, than dilute sulphuric acid. Eau de Rabel is simply Haller's acid (H_2SO_4 1, Alcohol 3) colored red with red poppy petals.—Rundschau (Prag) xii. 955.

AQUÆ.

Distilled Water—Preparation.—Mr. E. Mylius purifies distilled water completely by causing it to percolate through a charcoal filter immediately after its distillation. He employs freshly burnt and well washed wood-charcoal in fragments the size of a pea, and carefully sifted from fine particles. The water is caused to trickle slowly and equably through the filter by flowing first upon a stone-ware cover, inverted, the raised edges of which are serrated so as to cause the water to flow from it into the charcoal in numerous streamlets. The substratum of the filter is composed of glass balls or broken glass. The filter may be constructed from material obtainable in any pottery or glassware establishment. —Arch. d. Pharm., Feb. 1887, 128, from Pharm. Centralb., 1886, 27, 631.

Distilled Water—Preparation and Preservation.—Mr. J. N. Hurty makes some practical observations on the preparation and preservation of distilled water. Using a 5-gallon still, not more than 4 gallons of water should be introduced. Well-water is to be preferred. It must be boiled for some time immediately before its introduction into the still, thereby eliminating all ammonia. The first half gallon of distillate is rejected, the next 2½ gallons are collected. The water is again heated to boiling before it is placed in the container, from which it is drawn as wanted by means of a siphon-tube reaching to the bottom and provided at its outer arm with a rubber tube and clamp, while access of air to this container during the withdrawal of water must be through a glass tube loosely stopped with cotton.—Western Drugg., Jan. 1887, 4.

Ice Water vs. Distilled Water.—His attention having been drawn to a statement, attributed to Tyndall and others, which may be summarized as maintaining that ice water is purer than distilled water, Dr. R. G. Eccles replies that while this was conceded a few years ago, at present it is very seriously doubted. He reviews the experiments and opinions that have been recorded on this subject during the past few years, and expresses the opinion that every pharmacist living in or near the metropolis—meaning New York—must depend upon distilled water, and not try to substitute melted ice, unless he has no regard for the health or lives of his patrons.—Proc. N. Y. State Pharm. Assoc., 1887, 179–181.

Officinal Medicated Waters—Historical Review.—Professor J. U. Lloyd communicates an interesting review of the medicated waters that have been officinal since the publication of the Pharmacopœia of 1820. In that Pharmacopœia there were 10 waters officinal, viz: (1) Carbonic acid, (2) magnesia, (3) potash, (4) soda, (5) orange peel, (6) cinnamon, (7) peppermint, (8) spearmint, (9) rose, (10) distilled. All of these were retained in the N. Y. issue of the Phar. 1830, with the exception of (3). In the Philadelphia issue of the Phar. of 1830, (2), (3) and (4) were omitted, and camphor water was added. In the Phar. of 1840, (5) was also omitted, and fennel water was added. In 1850, bitter almond water was added; in 1860, ammonia water (hitherto "liquor"), orange flower, chlorine and creasote water; in 1870, carbolic acid and anise water; and in 1880, water (common) and stronger ammonia water were added, and carbonic acid water (10) omitted.—West. Drugg., March 1887, 145–146.

Bitter Almond Water—Determination of Hydrocyanic Acid.—The Pharm. Germ. directs the addition of magma of magnesium hydrate until the bitter almond water becomes perfectly opaque, then after addition of a little chromate of potassium, to titrate with $\frac{1}{10}$ n. silver solution, until a permanent precipitate of red chromate of silver remains. It has been found that the method gives low results, unless a considerable excess of magnesium hydrate is employed, or magnesium acetate is substituted for the hydrate. Messrs. Beckurts and Oelze now find that the pharmacopœial method gives good results if the mixture of bitter almond water, magnesium hydrate and chromate of potassium is allowed to stand for half an hour before titration. Under these circumstances the volatile oil is completely deprived of its hydrocyanic acid, which being united to the magnesia, readily reacts with the silver solution. Arch. d. Pharm., May, 1887, 403; from Pharm. Centralb., 1887, 131.

Mr. C. Schacht draws attention to another element of error in the employment of calcined magnesia for the above-named test of the Ph. Germ. He finds that calcined magnesia that may conform to all the tests required by that standard, may nevertheless contain sulphur—possibly as magnesium oxysulphide—which utterly unfits it for the reaction, since it forms in contact with nitrate of silver a deep black precipitate of argentic sulphide after a short period. The sulphur cannot be removed by simple boiling with water. The author has recently met with such magnesia.—Arch. d. Pharm., June 1887, 494; from Apoth. Ztg., No. 34.

Cherry Laurel Water—Sophistication.—Mr. Lajoux draws attention to a sophistication of cherry laurel water by water aromatized by nitrobenzol or, in some cases, by oil of bitter almonds. The practice seems to be quite common in France.—Arch. d. Pharm., Aug. 1886, 720; from Journ. Pharm. Chim., xiii, 429.

CERATA ET UNGUENTA.

Cerates and Ointments—Fusing Points, etc.—Mr. Jas. E. Buckley suggests that the composition of ointments should be so regulated, that their fusing points be merely a little higher than the temperature of the body, both in health and disease. The following fusing points were ascertained by introducing the preparation into a glass tube of one-eighth-inch bore, suspending this with a thermometer in water, and applying heat until the plug changed its position in the tube; and by heating the preparation in a cup placed in a water-bath, and stirring with a thermometer until entirely liquefied, the fluid point was determined. The preparations were all made strictly in accordance with the *U. S. Pharmacopœia* of 1880. The results were as follows, the temperature being given in degrees Centigrade:

	Fused.	Fld.	Congealed.
Ceratum	56.6	60	55.5
“ Camphoræ	57.7	62.7	53.8
“ Cantharidis	61.1	71.2	54.4
“ Cetacei	57.7	61.1	54.4
“ Extr. Canthar.	70	72.1	61.2
“ Plumbi subacet	60	62.2	54.4
“ Resinæ	51.1	54.4	48.8
“ Sabinæ	52.7	53.5	51.6

	Fused.	Fld.	Congealed.
Unguentum	52.9	53.9	51.1
“ Acidi Carbol	51.9	54.4	50
“ “ Gallici	34.4	40.5	23.9
“ “ Tann	34.4	38.3	23.8
“ Aquæ Rosæ	51.1	54.4	48.8
“ Belladonnæ	34.4	38.8	23.8
“ Chrysarob	34.4	38.8	23.8
“ Diachylon	51.6	58.6	44.4
“ Gallæ	34.4	40.5	23.8

	Fused.	Fld.	Congealed.
Ung. Hydrargyci	45.0	51.6	44.4 29.4
“ Hydrar. amm	33.8	38.8	23.8
“ “ nitrat	47.2	50	31.1
“ “ oxid. fl	52.7	60	46.6
“ “ “ rub.	50.5	54.4	42.2
“ Iodi	33.8	37.7	23.3
“ Iodoformi	35.5	39.4	23.8
“ Mezerei	50	52.2	48.3
Ung. Picis liquidæ	41.6	47.2	40.6
“ Plumbi carb.	33.8	40	23.8
“ “ iod	33.8	40	23.8
“ Potas. iod.	42.2	44.4	31.1
“ Stramonii	41.1	44.3	28.3
“ Sulphuris	45.5	50.5	28.3
“ Sulph. alkal	38.8	49.4	26.1
“ Veratrinæ	39.4	46.5	34.4
“ Zinci oxid.	40	44.2	34.4

—Amer. Jour. Pharm., Nov. 1886, 537–538.

Ointments—Practical Observations.—Dr. E. Mylius contributes some practical observations on the following ointments and cerates:

Hebra's Ointment is best prepared by digesting the component parts at a temperature below 100° C. from 24 to 36 hours, and stirring for several hours until all traces of water have been evaporated. When thus prepared Hebra's ointment is almost white, very mild and smooth, not rancid, and of greater stability than many of the officinal ointments. One drop of oil of cloves added to 50 gm. of ointment preserves it for a considerable period.

Cerate of subacetate of lead remains white and non-irritating, nor does it acquire a rancid odor when incorporated with 2 to 3 per cent. of boric acid.

Ointment of iodide of potassium should be prepared by adding the solution of iodide of potassium to the lard and after the lapse of one hour sufficient hyposulphite of sodium to decolorize it, and .05 per cent. of oil of cloves. Thus prepared ointment of potassium iodide will keep at least 8 weeks, and does not decolorize iodine when mixed with it.

Resorcin ointments frequently turn blue when applied to the skin, owing to the presence of free ammonia or carbonate of ammonium.—Pharm. Centralb., 1886, 515.

Ointments made with Stearic Acid—Various Formulas.—Mr. R. Rother prepares ointments either with stearic acid by itself or mixed with petrolatum (stearolatum) so as to give greater consistence to the latter; or, also, as an addition to other fatty bodies:

Stearolatum and Carbolic Acid.—

Carbolic acid	1 troy oz.
Stearic acid	2 “ “
Petrolatum, soft	7 “ “

Heat the stearic acid carefully until it is fused, then gradually add the petrolatum, maintaining the heat meanwhile until a perfectly fluid mixture is obtained; to this add the carbolic acid, either previously fused or in detached crystals; stir until the whole is perfectly mixed, and set it aside, stirring it up occasionally until cooled.

Stearate of Veratrine.—

Veratrine	592 parts.
Stearic acid	284 "

Fuse the stearic acid, and gradually add the veratrine, with constant stirring, until complete union is effected and a brownish syrupy mass results. After cooling, reduce the transparent, brittle stearate to a powder by appropriate means.

Veratrine Ointment.—

Veratrium stearate	6 parts.
Petrolatum	94 "

Heat the veratrium stearate with 24 parts of the petrolatum until the salt is all dissolved, then add the remaining petrolatum and thoroughly mix the whole. If desirable, stearolatum can be used in place of the petrolatum.

Stearate of Zinc.—This is obtained when oxide of zinc is added to stearic acid in equivalent proportions—about 1 of the former to 1 of the latter, a white, voluminous, apparently non-crystallizable powder, fusible at about 130° C., being produced. In practice the author increases the stearic acid by 50 per cent., and recommends the following formula and method for making

Zinc Ointment.—

Zinc oxide	2	lbs. avoir.
Stearic acid	¾	" "
Lard	7¼	" "
Benzoin,		
Balsam tolu, of each	1 oz.	"

Melt the stearic acid, and gradually add 5¼ lbs. of the lard, maintaining the heat meanwhile; to this add the benzoin and tolu, and heat the mixture for about half an hour at a temperature of 60° C. or more, keeping it well stirred; then decant the fluid portion from the hardened residue. Pass the zinc oxide through a No. 80 sieve, and add the remaining lard, previously fused, and mix. Now gradually add the rest of the fused excipient, prepared as already directed, and stir the mixture continually meanwhile. If not sufficiently firm to set aside, stir the ointment during the necessary period while cooling.

Stearate of Lead is readily obtained by heating stearic acid and carbonate of lead together in equivalent proportions. It is a yellowish fusible body forming a bulky powder, dissolving readily in hot petrolatum, separating on cooling, but retained better by the addition of a little resin. The author recommends the following formula for

Ointment of Stearate of Lead.—

Lead carbonate	1 part.
Stearic acid	3 "
Resin	1 "
Petrolatum, sufficient to make	10 "

Heat the stearic acid and lead carbonate until effervescence ceases, then add the resin, and when this has fused add petrolatum until the mixture weighs 10 parts, and thoroughly incorporate the whole.

Tar Ointment.—This is recommended to be made as follows:

Oil of tar	1 part.
Stearic acid	2 "
Petrolatum	7 "

Melt the stearic acid and gradually add the petrolatum. Set the fluid mixture aside to cool, and thoroughly incorporate the oil of tar before the ointment stiffens.—Drugg. Circ., September 1886, 197.

Salve Pencils—Formulas.—Dr. H. C. Brooks draws attention to the *salve pencils* (Salbenstifte) recommended by Dr. Unna, which he finds very valuable substitutes for ointments for certain purposes. They are based on the model of the ordinary lip-salve pencils, and may, when suitably medicated (with zinc oxide, tar, chrysarobin, etc.), be rubbed quickly into any limited dry eruption of the skin, which thus becomes covered with a coating of hard ointment. The basis of the salve pencils is composed of olibanum, resin, olive oil, wax, in varying quantities according to the nature of the medicament, with the addition of a little colophonium to give greater adhesive power. The medicaments employed may, of course, be any of those ordinarily made use of in ointments. In cases where a fatty body is not desirable, Dr. Unna recommends

Paste Pencils.—The basis of these pencils is made up of starch, dextrin and white sugar, mixed with a little quantity of tragacanth. Dr. Brooks has found these somewhat hard and scratchy, and thinks that they might be made much more useful if of softer consistence, for the idea is undoubtedly a good one.

The following are some of Dr. Unna's formulas:

Stilus acidi salicylici dilubilis:

	10 p. ct.	40 p. ct.
Precipitated salicylic acid	10 parts;	40 p
Powdered tragacanth	5 "	5 "
Powdered starch	30 "	10 "
Powdered dextrin	35 "	25 "
Powdered white sugar	20 "	20 "

Stilus arsenico-sublimatus dilubilis:

Powdered arsenious acid	10 parts.
Corrosive sublimate	5 "
Powdered tragacanth	5 "

Stilus arsenico-sublimatus dilubilis:

Powdered starch	30 parts.
Powdered dextrin	30 "
Powdered sugar	20 "

Stilus iodoformi dilubilis:

Iodoform	40 parts.
Powdered tragacanth	5 "
Powdered starch	10 "
Powdered dextrin	30 "
Powdered white sugar	15 "

Stilus ichthyoli dilubilis:

Sodium sulpho-ichthyolate.	20 parts.
Powdered tragacanth . . .	5 "
Powdered starch	30 "
Powdered dextrin	35 "
Powdered white sugar . .	10 "

Stilus saponatus kalinus dilubilis:

Anhydrous potash soap . .	60 parts
Powdered white bole . . .	40 "

Stilus acidi carbolici unguens:

	10 p. ct.	30 p. ct.
Carbolic acid	10 parts;	30 p
Powdered olibanum . . .	20 "	20 "
Yellow wax	40 "	50 "
Olive oil	30 "	— "

Stilus acidi borici unguens:

Boric acid	10 parts.
Yellow wax	40 "
Benzoinated olive oil . . .	35 "
Colophony	5 "

Stilus cantharidini unguens:

Cantharidin	0.5 parts.
Colophony	10 "
Yellow wax	45 "
Benzoinated olive oil . . .	45 "

Stilus creasoti:

Creasote	40 parts.
Powdered olibanum . . .	20 "
Yellow wax	40 "

Stilus iodoformi unguens:

Iodoform	40 parts.
Colophony	5 "
Yellow wax	30 "
Olive oil	25 "

Stilus iodi unguens:

Pure iodine	20 parts.
Colophony	5 "
Yellow wax	40 "
Olive oil	35 "

Stilus plumbi oleatis et acidi salicylici unguens:

Precipitated salicylic acid.	20 parts.
Lead plaster	40 "
Yellow wax	20 "
Olive oil	20 "

Stilus saponis, picis et ichthyoli unguens:

Anhydrous potash soap. .	10 parts.
Liquid tar	10 "
Sodium thioichthyolate . .	5 "
Colophony	5 "
Yellow wax.	40 "
Benzoinated olive oil . .	30 "

Stilus zinci sulphocarbolatis unguens:

Sulphocarbolate of zinc. .	5 parts.
Powdered castile soap . .	15 "
Colophony	5 "
Yellow wax	40 "
Olive oil	35 "

Amer. Jour. Pharm., Nov. 1886, 548–549; from Med. Chron., Aug. 1886, and Monatshefte f. prakt. Dermat., 1886.

Lanolin — Preparation. — Mr. F. Fialkowski recommends soaking sheep's wool in cold water for 24 hours, and afterward washing it well until the water remains clear. The wool is then boiled twice with water and pressed while hot, when the lanolin is obtained of a whitish color, much lighter than the commercial article. Twelve pounds of wool yielded 18 ounces of lanolin, or about 11 per cent. Amer. Jour. Pharm., Nov. 1886, 536.

Subacetate of Lead Ointment (*Ungt. Plumbi. P. G.*)—*Preservation.*— Mr. E. Mylius has studied the effect of different agents for the preservation of the lead ointment of the Germ. Pharm., and finds benzoic acid, boric acid and oleum styracis to be the most effective. Of these, again, he finds boric acid to be the best, using it in the proportion of 2–3 per cent. None of the agents, however, secure the ointment from change permanently. Arch. d. Pharm., Dec., 1886, 1026; from Pharm. Centralb., 1886, 27, 515.

Diachylon Ointment—Improved Method of Preparation.—Mr. E. Mylius observes that to secure a perfectly white, mild, smooth and stable diachylon ointment, it is not desirable to employ the lead plaster ready formed, but to form it along with the other ingredients that make up the ointment. The litharge and fats are maintained at 100° with stirring for hours, and the heat is then continued for 25–36 hours, until all of the water has evaporated. Arch. d. Pharm., Dec. 1886, 1025; from Pharm. Centralb., 1886, 27, 515 et seq.

Mercurial Ointment—Preparation with Wool-Fat and Petrolatum.—Mr. C. S. Hallberg observes that when 5 grams of mercury are triturated with 1.5 grams of wool-fat, the mercury may be completely extinguished within 10 minutes. The addition then of 3.5 grams of petrolatum furnishes an ointment in which the mercury is divided to a much greater degree than is usual when following the officinal formula, and, moreover, possesses greater absorbability than when the officinal fats are employed.—West. Drugg., Oct. 1886, 364.

Unguentum Zinci Oxidi—Modified Process.—Mr. Jos. P. Williams recommends a somewhat firmer ointment that the officinal. It is made by triturating 5 oz. of oxide of zinc with 4 oz. of glycerin until a smooth paste is obtained. Then melt 1 oz. of white wax, add gradually 15 oz. of benzoinated lard, keeping the temperature near 140° F.; now stir until the mixture begins to thicken, add the zinc oxide prepared as before, and continue the stirring until thoroughly mixed and perfectly smooth.—Amer. Jour. Phar., Nov. 1886, 538.

Iodide of Potassium Ointment—Lanolin to Facilitate Admixture with Petrolatum.—To mix solutions of iodide of potassium with petrolatum the "Süd Deutsche Apotheker Zeitung" recommends the addition of a small quantity of lanolin. The ointment is quickly made, is smooth, and does not separate even after standing a long time.

Iodide of Potassium Ointment—Method of Preservation.—Mr. E. Mylius finds that if the iodide of potassium and lard are mixed and allowed to stand about an hour, the yellow color may be removed by the addition of just sufficient hyposulphite of sodium, when the ointment acquires a certain stability, remaining unchanged for at least eight weeks. The addition of 0.05 per cent. of oil of cloves increases the stability.—Arch. d. Pharm., Dec. 1886, 1026; from Pharm. Centralb., 1886, 27, 515, *et seq.*

Unguentum Cretæ Præparatæ—Formula and Uses.—This ointment is recommended by Dr. Dyce Duckworth, as an application in erysipelas. It is prepared from equal parts of prepared chalk and lard, and to each ounce of the ointment is added 30 grains of carbolic acid. An equally serviceable ointment is obtained with precipitated calcium carbonate, and this is of a pure white color.—Practit., Jan. 1887.—Am. Jour. Ph., June, 294.

Ointment of Boroglyceride—Formula.—Mr. Clarence E. Downes states such an ointment is made in the Jefferson Hospital by heating one part of boroglyceride, containing 50 per cent. of boric acid, and while hot, adding it slowly to three parts of petrolatum, the stirring being continued until the mixture has thoroughly cooled, in order to avoid separation of the ingredients. The ointment is a very convenient vehicle for atropine, physostigmine, chloride of zinc, and other remedies.—Amer. Jour. Phar., Nov. 1886, 538.

Wilkinson's Ointment—Formula.—According to Dr. Hager, this ointment contains *Beguin's spiritus sulphuris*, prepared from washed sulphur 1 part, and stronger ammonia 6 to 8 parts, with sufficient sulphuretted hydrogen gas, until solution is effected. The ointment is a mixture of Beguin's liquor 1 part, prepared chalk two parts, and flowers of sulphur, lard and liquid tar of each 25 parts.

A modified formula has been used with advantage by Dr. Behrend in the Berlin Hospital for skin diseases, and is as follows: Sublimed sulphur 8, liquid tar 8, soft soap 16, lanolin 16, and powdered pumice 5 parts.—Amer. Jour. Pharm., Nov. 1886, 536.

CHARTÆ.

Mustard Paper—Quantitative Determination of Volatile Oil Producible.—Mr. E. Dieterich (Helfenberger Annalen, 1886,) recommends the following method for determining the strength of mustard paper. A measured quantity, say 100 sq. cc., is cut into from 20 to 30 strips, these are placed in a flask arranged for distillation, 50 cc. of water at 20–25° C. are added, the whole is digested for several minutes with gentle agitation, and the fermentation is then interrupted by the addition of 5 cc. alcohol. 2.0 grams of olive oil are added to prevent frothing upon heating, and the contents are subjected to distillation, the distillate being collected in 10 cc. of liq. ammon. caust. contained in a 100 cc. flask until 25–30 cc. of distillate have passed. The contents of the receiver are brought to 100 cc. with water, an excess of solution of nitrate of silver is added, the precipitate allowed to subside, dried at 100°, and weighed. The weight of the silver sulphide so obtained, multiplied by 0.4301, gives the quantity of volatile oil of mustard produced. By varying the time for the interruption of the fermentation (addition of alcohol) from 1 to 2, 3, 4, 5 or 10 minutes, different yields of volatile oil are thus obtained; and from these, and comparison with the results obtained with paper of known quality, the relative value of the mustard paper is determined. In actual experiments made by the author with papers from different sources, he obtained after 1 minute's fermentation, from 0.0069 to 0.0326; after 5 minutes, from 0.0133 to 0.0363, and after 10 minutes, from 0.0142 to 0.0369 grams of volatile oil from 100 sq. cc. of the paper.—Arch. d. Pharm., June 1887, 496–497.

Charta Naphthalini—Use for Exterminating Moths.—According to

Pharm. Rundschau (Prag.), xii, 594, naphthaline leaves, useful for exterminating moths, are obtained by melting together carbolic acid and ceresin, each one part, naphthalin two parts, and painting the melted mixture on sheets of unglazed paper.

Luminous Paper—Preparation.—The following formula, given in "Pharm. Zeit. f. Russl." (xxv, 712), yields an impervious paper which is luminous in the dark. Water, 100 p.; paper, 40 p.; phosphorescent powder (see *Sulphide of Calcium* under "Inorganic Chemistry"), 10 p.; gelatin, 1 p.; bichromate of potassium, 1 p.

COLLODIUM.

Iodoform Collodion—Formula and Uses.—According to "Nouv. Remèdes (1886, 525), a solution of 1 part of iodoform in 15 parts of collodion has been successfully used in the treatment of neuralgia. Occasionally 10 per cent., or even 25 per cent. solutions have been employed. An older formula is that of James, who directs 5 parts each of iodoform, balsam of Peru, and soap, dissolved in 85 parts of collodion.—Amer. Jour. Pharm., Feb. 1887, 72.

Collodium Corrosivum—Formula and Uses.—Collodium corrosivum is prepared by dissolving 1 part of corrosive sublimate in from 30 to 40 parts of collodion (12 to 15 grains in 1 fluidounce). It may be used in those cases where the gradual effects of mercuric chloride are needed, and has been used more particularly for the removal of warts, the application being made once a day.—Amer. Jour. Pharm., June 1887, 294.

CONFECTIONES.

Chocolate—Detection of the Presence of Flour.—Mr. Pennetier recommends the following method for the detection of flour in chocolate. The chocolate is treated with water to remove sugar, with alcohol to remove coloring matter, with ether to remove fat, then dried and finely powdered. Portions 0.01 gram of the chocolate so treated are now mixed with portions of 1, 2, 3, 4, 5, and 6 drops of a mixture of one volume of water and two volumes of glycerin, with 5 per cent. of tincture of iodine. The samples are then compared under the microscope with corresponding samples of chocolate containing known quantities of flour.—Arch. de Pharm., May 1887, 412; from Jour. de Pharm. et de Chim., 1887, xv, 141.

Acorn-Cacao—Reputed Value in Infantile Diarrhœa.—Acorn-chocolate has long been in use in Europe, and is prepared in France by incorporating 1000 parts of simple chocolate (made of cacao seeds 6000, sugar 5000, and powdered cinnamon 30 parts) with 30 parts of roasted acorns.

Hager's formula is equal parts of roasted acorns, white sugar and cacao-mass, the latter being the seeds, roasted, deprived of the shells and beaten to a uniform mass in a warm mortar.

Recently acorn-cacao has attracted some attention in the treatment of diarrhœa and vomiting in children. It is said to be made of powdered cacao seeds deprived of fat, to which are added an aqueous extract of roasted acorns, a little sugar, and some roasted flour. The proportions of the ingredients are not given. A teaspoonful of the powder is mixed with cold water, heated to boiling with constant stirring, and this quantity is administered thrice daily by means of a spoon or feeding cup.—Amer. Jour. Pharm., Dec. 1886, 597.

ELIXIRES.

Elixirs—New Formulas.—Prof. Joseph P. Remington communicates formulas for a large series of elixirs as a contribution to the work of the Committee on National Formulary. These formulas may, or may not, find their way into the report of that Committee, but cannot be reproduced here without taking up more space than is justified in this report. It may be of service, however, to give the titles here for convenient reference, since the construction of the formulas is based upon comprehensive experiments, and the products have been carefully tested. The number appended to each title refers to the page in "Druggists' Circular," 1887, on which the formula is given.

Spiritus Fragrans, 51.
Elixir Fragrans, 51.
Liquor Extracti Glycyrrhizæ, 51.
Elixir Acidi Salicylici, 51.
Elixir Adjuvans, 51.
Elixir Ammonii Bromidi, 51.
Elixir Ammonii Valerianatis, 75.
Elixir Ammonii Valerianatis et Quininæ, 75.
Elixir Anisi, 75.
Elixir Bismuthi, 75.
Elixir Buchu, 75.
Elixir Buchu Compositum, 75.
Elixir Caffeinæ, 75.
Elixir Calcii Bromidi, 75.
Elixir Calcii Bromo-Iodatum Compositum, 75.
Elixir Calcii Hypophosphitis, 76.
Elixir Calcii Iodidi, 76.
Elixir Calcii Lactophosphatis, 102.
Elixir Catharticum Compositum. *See* Elixir Purgans.
Elixir Chiratæ, 102.
Elixir Chloral et Potassii Bromidi Compositum, 102.
Elixir Chloroformi, 102.
Elixir Cinchonæ, 102.
Elixir Cinchonæ Detannatum, 102.

Tinctura Cinchonæ Detannatum, 102.
Elixir Cinchonæ et Ferri, 102.
Elixir Cinchonæ et Phosphatum Compositum, 102.
Elixir Cinchonæ, Ferri, Bismuthi et Strychninæ, 102.
Elixir Cinchonæ, Ferri et Bismuthi, 102.
Elixir Cinchonæ, Ferri et Calci Lactophosphatis, 102.
Elixir Cinchonæ, Ferri et Strychninæ, 102.
Elixir Curassao, 102.
Spiritus Curassao, 102.
Elixir Erythoxyli, 103.
Elixir Eucalypti, 103.
Elixir Euonymi, 103.
Elixir Ferri Hypophosphitis, 123.
Elixir Ferri Phosphatis, 123.
Elixir Ferri Phosphatis, Cinchonidinæ et Strychninæ, 123.
Elixir Ferri Phosphatis, Quininæ et Strychninæ, 123.
Elixir Ferri Pyrophosphatis, 123.
Elixir Ferri Pyrophosphatis et Strychninæ, 123.
Elixir Ferri Pyrophosphatis, Quininæ et Strychninæ, 123.
Elixir Ferri, Quininæ et Strychninæ, 123.
Elixir Frangulæ, 123.
Elixir Gentianæ, 123.
Elixir Gentianæ cum Tinctura Ferri Chloridi, 123.
Tinctura Ferri Citro-Chloridi, 123.
Elixir Gentianæ Ferratum, 123.
Elixir Glycyrrhizæ, 123.
Elixir Glycyrrhizæ Aromaticum, 123.
Elixir Grindeliæ, 123.
Elixir Guaiaci, 123.
Elixir Guaranæ, 123.
Elixir Humuli, 123.
Elixir Hypophosphitum Compositum, 123.
Elixir Lithii Bromidi, 123.
Elixir Lupulini, 123.
Elixir Malti et Ferri, 123.
Elixir Matico Compositum, 124.
Elixir Pepsini, 124.
Elixir Pepsini, Bismuthi et Strychninæ, 124.
Elixir Pepsini et Bismuthi, 124.
Elixir Pepsini et Ferri, 124.
Elixir Phosphori, 124.
Spiritus Phosphori, 124.
Elixir Phosphori et Nucis Vomicæ, 124.
Elixir Pilocarpi, 124.

Elixir Potassii Bromidi, 124.
Elixir Purgans, 124.
Elixir Quininæ Compositum, 124.
Elixir Quininæ et Phosphatum Compositum, 124.
Elixir Quininæ et Strychninæ Valerianatum, 124.
Elixir Quininæ Valerianatum, 124.
Elixir Rhamni Compositum, 124.
Elixir Rhei, 124.
Elixir Rubi, 124.
Elixir Sodii Bromidi, 124.
Elixir Sodii Hypophosphatis, 124.
Elixir Sodii Salicylatis, 124.
Elixir Stillingiæ Compositum, 124.
Elixir Strychninæ Valerianatis, 124.
Elixir Taraxaci Compositum, 124.
Elixir Turneræ, 124.
Elixir Viburni, 124.

Elixirs.—Suitable forms of *Ferric Citrates* for their preparation. See *Ferric Citrates* under "Organic Chemistry."

Elixirs—Aromatic Liquor for their Preparation.—Mr. R. Rother suggests that for the preparation of elixirs an aromatic liquor be kept in stock, for which he suggests the name

Alcarome, and which he recommends to be prepared as follows: The shells are removed from three drachms of cardamoms and the grains triturated to a fine powder. One and a half troy ounces of coriander are then also finely powdered. The two powders are then mixed with ten drops of oil of cassia and half a troy ounce of powdered magnesium carbonate. This powder is now added to a mixture of 2 pints of alcohol and 4 pints of water. The whole is set aside for several days, well shaken at intervals, then poured into a filter and the filtrate brought to the measure of six pints by the addition of enough (⅓) alcohol through the filter.

Glycarome is the term applied by the author to the simple elixir obtained by mixing 3 measures of "alcarome" with 1 measure of glycerin, the latter being regarded by him preferable to sugar for the preparation of elixirs in general. From the new double salt, valerianate of magnesium and ammonium (which see under "Organic Chemistry") the author proposes the preparation of an elixir, or rather

Glycarome of Magnesium and Ammonium.—It may be prepared best, however, direct from valerianic acid, as follows: One troy ounce of valerianic acid is mixed with 6 fluidounces of water and 125 grains of ammonium bicarbonate. After all the bicarbonate is added and decomposed, an excess (about 3 drachms) of magnesium carbonate is incorporated during occasional stirring. One drachm of cochineal is now rubbed to a fine powder and mixed with the solution of the valerates. The mixture is then poured into a filter, and when all the liquid has passed down, followed by alcarome until 24 fluidounces of filtrate are collected. To this, 8 fluidounces of glycerin are added and the whole well mixed.—Amer. Jour. Pharm., April 1887, 172–173.

Elixir of Hypophosphites—Formula.—In connection with his paper on *Syrup of Hypophosphites*, (which see under "Syrupi") Mr. C. H. Bernhard communicates the following formula for an elixir, corresponding in strength to the officinal syrup: Hypophosphite of calcium, 360 grains; hypophosphite of sodium, 120 grains; hypophosphite of potassium, 120 grains; citric, or hypophosphorous acid, 10 grains (omit either or both, if desired); distilled water, 4 ounces; glycerin, ½ ounce; spirit of cardamom compound, ½ ounce; elixir of orange to make one pint. Filter.—Pharm. Rundschau, 1886, 197.

Chartreuse Liqueur—Formula and Process of Preparation.—The following formula is given in "Rundschau," Prag. xii. To prepare chartreuse liquor none but spirits free from fusel oil should be used. Angelica seed, 125 grams; angelica root, 30 grams; arnica flowers, 15 grams; coriander, 250 grams; hyssop, 125 grams; melissa, 500 grams; wormwood, 125 grams; cardamom, 15 grams; Ceylon cinnamon, 15 grams; mace, 20 grams, and cloves, 15 grams, are digested for 24 hours in 36 liters of 95 per cent. alcohol and 20 liters of water, and then distilled. To the distillate are added 25 kilograms of sugar previously boiled with water, 2 liters of finest cognac, 25 grams of citric acid previously dissolved in water, and sufficient water to make 100 liters. Chartreuse is colored golden yellow with tincture of saffron, and should be two years old before using.—Amer. Jour. Phar., Dec. 1886, 610.

EMPLASTRA.

Lead Plaster—Determination of Quality.—Since lead plaster is frequently purchased, it becomes of interest to determine its composition. Mr. A. Kremel finds that a plaster made with *oleic acid*, being almost completely composed of oleate of lead, is completely, or nearly so, soluble in ether. When made with *olive oil* it contains stearate and palmitate of lead and more or less glycerin along with the oleate, and consequently from 17–20% of its weight is insoluble in ether. When made from *lard* the amount of insoluble lead compounds is still greater, from 40–50 per cent. remaining undissolved by ether.—Arch. d. Pharm., May 1887, 405; from Pharm. Post, 1887, 190.

Iodoform Plaster—An Excellent Application for Chafed Surfaces.—The following is recommended in Phar. Centrlb. (xxviii, 253.) Dissolve 5.0 pure gelatin in 25.0 hot water, and add 1.0 each of glycerin and iodoform.

This mixture is spread on shirting. To use it, it is immersed in water and slightly warmed, when it becomes soft and flexible.

ESCHAROTICA.

Chloride of Zinc Paste—Preparation.—Mr. A. Brunner communicates the following formula as forming a very satisfactory chloride of zinc paste for surgical use: 20 parts of chloride of zinc, 15 parts of wheat flour (or 20 parts of wheat starch) and 5 parts of oxide of zinc, are made into a consistent paste, which is rapidly shaped into cones or other suitable form. The mass becomes considerably heated during the manipulation, but soon hardens. The finished pastils may be rolled in talc.—Arch. d. Pharm., May 1887, 405; Pharm. Ztg., 1887, 203.

EXTRACTA.

Officinal Extracts—Yield by the U. S. Pharm. Process.—Mr. Francis J. Lammer, jr., prepared the following extracts according to the direction of the U. S. Pharmacopœia, and determined the percentage yield of the finished product.

Extr.	Aconiti	12.766 per cent.	Extr.	Hyoscyami alcoh	16.64	per cent.
"	Aloes aquosum	91.54 "	"	Iridis	8.9	"
"	Arnicæ radicis	19.53 "	"	Juglandis	16.82	"
"	Belladonnæ alcoh	32.23 "	"	Krameriæ	8.4	"
"	Cannabis indicæ	16.56 "	"	Leptandræ	15.97	"
"	Cinchonæ	26.4 "	"	Malti	44.72	"
"	Colchici radicis.	23.2 "	"	Mezerei	7.1	"
"	Colchici seminis*	9.63 "	"	Nucis vomicæ	6.17	"
"	Colocynthidis	15.135 "	"	Opii	49.6	"
"	" comp.	95.77 "	"	Physostigmatis	6.2	"
"	Conii alcohol	10.73 "	"	Podophylli	8.31	"
"	Digitalis	25.5 "	"	Quassiæ	2.24	"
"	Euonymi	18.31 "	"	Rhei	25.66	"
"	Gentianæ	44.6 "	"	Stramonii	14.02	"
"	Glycyrrhizæ purum	25.32 "	"	Taraxaci	11.3	"
"	Haematoxyli	5.3 "				

Pharmaceutical Extracts—Relative Merits of the Different Forms.—Mr. O. Schweissinger reviews the relative merits of the different forms of pharmaceutical extracts—solid and fluid—that are at the present day in use. He divides them into two groups: (1) The solid extracts, or such as are obtained by the extraction of the drug with the appropriate solvent, and evaporation of the extraction to the consistence that is most desirable or expedient; and (2) the fluid extracts, abstracts, and *extracta solida Helfenberg*. The preparations of the first group bear no definite relation to each other, nor to the drug from which they are obtained, whilst those of the second group are prepared of such strength that they

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* Menstruum the same as for the corresponding fluid extract.

uniformly represent the same amount of the drug; in the case of the fluid extracts and the Helfenberg solid extracts, 1 part from 1 of drug; in the case of the abstracts 1 part from 2 of drug. The author regards the preparations of the second group as being the more desirable form of preparations, representing, as they do, definite quantities of the drug, and enabling, therefore, the more ready determination of the dose. Moreover, these latter preparations are as readily standardized as those of the first group, over which they possess the further advantage that, where standardizing is not possible, they are at least definite representatives of the medicinal agent from which they are made.—Arch. d. Pharm., Feb. 1887, 130–131; from Pharm. Centralb., 1886, 27, 617.

Extracts—Examination.—Mr. Eugen Dieterich draws attention to the difficulties encountered in the examination of solid extracts. Their physical characters, and their behavior to solvents, resulting in clear or turbid solutions, are totally inadequate to properly judge of the character of these preparations, the more particularly when it becomes incumbent upon us to make the examination for possible sophistications. With a view to finding a method that may eventually lead to practical usefulness, the author has examined a large number of extracts and determined their specific gravity, the amount of water, the amount of ash, and the amount of carbonate of potassium in the ash. While the first two—the sp. gr. and amount of water—do not give any figures that are of practical value, the determination of the amount of ash, and of the carbonate of potassium, has given figures that seem calculated to serve a good purpose for the identification or sophistication of extracts; there being often a wide range between the percentage of the pure extract and the one with which it is likely to be sophisticated. As a matter of record, the author's results, as tabulated, may properly find place here:

	Sp. gr. at 200.	Water in 100 Extr.	Ash from 100 Extr.	Carb. Potass. from 100 Extr.
Extr. Absinthii	1.1263	22.40	18.63	8.05
" Aconiti	1.1129	29.75	2.60	1.38
" Aloes	...	4.23	2.50	0.34
" Belladonnæ	1.1275	26.85	14.00	6.44
" Calami.	1.1153	22.25	6.56	0.92
" Cannabis indicæ	...	5.93	0.26	traces
" Cardui biened	1.1286	25.50	19.16	5.75
" Cascarillæ	1.1094	31.00	19.06	3.98
" Centaurii	1.1273	24.80	10.20	3.45
" Chelidonii	1.1254	21.60	19.56	13.11
" Chinæ aquos	1.0958	26.43	7.06	2.30
" " spirit.	...	7.23	2.26	0.57
" Colocynthid	...	2.56	16.26	9.31
" Conii	1.1263	10.10	20.06	12.75
" Cubebarum	...	7.10	0.16	traces
" Digitalis	1.1250	23.90	12.00	5.52
" Dulcamaræ	1.1173	29.50	13.10	2.76
" Ferri pomat	1.1292	20.06	11.60	1.03
" Filicis	...	1.90	0.26	not det'rminab.
" Gentianæ	1 1162	20.25	2.23	0.93
" Gramines	1.1273	26.90	5.00	3.68
" Helenii	1.1159	28.50	7.26	2.99
" Hyoscyami	1.1284	19.70	22.00	9.66
" Lactucæ viros	1.1144	24.40	23.20	10.12
" Liquiritiæ rad	1.1087	26.06	9.60	0.72
" Malti spiss	1.1172	19.06	1.23	0.23
" Millefolii.	1.1281	23.75	18.90	6.55
" Opii	...	10.06	6.53	0.23
" Quassiæ	...	5.40	23.20	4.37
" Rhei	...	7.73	4.43	2.30
" Salinæ	1.1030	15.40	2.63	1.26
" Scillæ	1.1064	18.50	0.70	0.23
" Secali cornuti	1.1174	17.70	11.10	2.87
" Strychni spir	...	2.70	3.26	0.92
" Taraxaci	1.1372	18.23	12.93	4.71
" Trifolii fibr	1.1220	16.63	11.26	8.28
" Valerianæ	1.1124	17.10	4.93	2.76

The author expresses the opinion that by repeating these experiments with the same extracts made at different periods and from different samples of the drug, average figures will be obtained that may serve for the identification and valuation of an extract under examination. Arch. d. Pharm., Jan. 1887, 60–64.

Extracts—Examination.—In continuation of his experiments on narcotic extracts (see Proceedings 1886, 319), Mr. O. Schweissinger has extended his examination to other extracts, embracing extractum graminis, extractum trifolii, extractum colombo, extractum hydrastis canadensis, and extractum ligni campechiani.—Arch. d. Phar., Jan. 1887, 34–35; Pharm. Centralb., 1886, 27, 597 and 613.

Narcotic Extracts—Estimation of Alkaloids.—Mr. Eugen Dieterich communicates the results of numerous experiments made to determine a practical method for the determination of the alkaloids in narcotic extracts. He recommends the following process and manipulation, the process practically consisting in: (1) Liberation of the alkaloid; (2) Extraction with ether; (3) Evaporation of the ethereal solution (which requires careful attention); and (4) Titration. As applied to the

Extracts of Belladonna, Conium, Hyoscyamus and Aconite, the details are as follows: Triturate 0.2 grams of powdered lime, prepared from marble, with 3 gm. of water, add 2 gm. of extract, when dissolved carefully add 10 gm. powdered lime. The mixture is then placed in a closed continuous displacement apparatus, the receiving bottle containing about 30 gm. of ether is suspended over a water-bath (not too hot) and the process of extraction is regulated by bringing the ether bottle nearer or further from the water-bath. With extracts of belladonna, aconite, and hyoscyamus, extraction is carried on for 30 or 45 minutes at the highest. Conium extract requires at least two hours. It is advisable to exhaust a second time with ether. The ethereal solution of the alkaloids is transferred to a tared porcelain capsule, and the receiving bottle rinsed two or three times with small portions of ether; 1 cc. of distilled water is added, and the ether carefully evaporated over a water-bath at a temperature not exceeding 30° C., care being taken not to work near hydrochloric, nitric, acetic or other volatile acid. The residue, weighing 1.5 grams, is dissolved in 0.5 cc. of alcohol, spec. grav. 892, the solution diluted with 10 cc. distilled water, and after adding one or two drops of rosolic acid solution (1 : 100 alcohol) titrated with 100th normal sulphuric acid, each cubic centimeter of which neutralizes 0.00289 gm. atropine or hyoscyamine, 0.00523 gm. aconitine, and 0.00127 conine.

The following results were obtained:

Extract of belladonna (13 experiments) 1.170, 1.184, 1.163, 1.170, 1.156, 1.142, 1.156, 1.142, 1.156, 1.170, 1.184, 1.170, 1.170 per cent.

Extract of aconite root (6 experiments), 1.305, 1.252, 1.279, 1.252, 1.279, 1.279 per cent.

Extract of hyoscyamus (6 experiments) .780, .766, .766, .751, .751, .766 per cent.

Extract of conium (6 experiments) .609, .597, .622, .622, .597, .589 per cent.

Some slight modifications in the manipulations are necessary for the examination of

Extract of Nux Vomica.—0.2 gm. powdered lime and 1 gm. extract of nux vomica are intimately mixed, 3 cc. of distilled water added and evenly mixed with 10 gm. powdered lime, then exhausted in the same manner as before for 1½ or 1¾ hours. The receiving bottle is rinsed with alcohol twice and then with ether, and after adding 1 cc. of distilled water the percolate is evaporated in a tared porcelain capsule (at the same temperature and with the same caution as stated above) to 1.5

grams; then add 0.5 cc. of alcohol sp. gr. .892, 10 cc. of distilled water, and 2 drops of rosolic acid solution, and titrate with 1-20th normal sulphuric acid. Toward the end it is advisable to use delicate blue litmus-paper conveying the solution on the paper by means of platinum wire; 1 cc. of 1-20th normal sulphuric acid corresponds to 0.0182 grams of alkaloid.

The method may be modified by triturating 1 gm. extr. nux vomica with 3 cc. normal ammonia and adding 10 gm. powdered lime. The first process yielded the following results of six experiments: 18.74, 18.92, 18.74, 18.56, 18.65 per cent. alkaloid.—Amer. Jour. Pharm., April 1887, 179–187; from Pharm. Centralb., 1887.

Narcotic Extracts.—Change in the process for their preparation in the New Belgian Pharmacopœia. Mr. Daenen draws attention to the change in the process for preparing narcotic extracts in the New Belgian Pharmacopœia, which, similarly to the Pharm. Germ., now directs the precipitation of the expressed juice by alcohol, and evaporation of the filtrate. Formerly the juice was directly evaporated. By the new process the yield is about one-third less, and the strength correspondingly increased. Arch. d. Pharm. Aug., 1886, 721; from Journ. Pharm. Chim., xiii. 424.

Standard Extract Belladonna--Method of Preparation.—Messrs. Dunstan and Ransom prepare a standard extract of belladonna, containing 2 per cent. of total alkaloid, to be prepared as follows: Macerate belladonna root in No. 20 powder, 1 pound, with 40 fluidounces of a mixture of alcohol 48 fluidounces, and distilled water 12 fluidounces; after two days transfer to a percolator, displace by adding the remaining liquid, express, filter, mix and measure the exact volume of the tincture; of this evaporate 50 cc. over a water-bath, until the alcohol is dispelled, dissolve the extract in 5 cc. of warm distilled water acidulated with dilute hydrochloric acid, filter through a little cotton wool into a suitable separator, add ammonia until distinctly alkaline, and agitate with 5 cc., and afterwards with 3 cc. of chloroform. Mix the chloroformic solutions and agitate this with 5 cc., and then with 3 cc. of dilute hydrochloric acid; mix the acid solutions, render alkaline with ammonia, and agitate as before, with 5 cc. and 3 cc. of chloroform. Evaporate the chloroformic liquid, dry the residue at 200° F. (it should then be nearly colorless), weigh carefully, and calculate the total amount of alkaloid present in the tincture. Evaporate this to dryness over a water-bath, and add sufficient sugar of milk to make the mixed product exactly fifty times the weight of the total alkaloid found to have been present in the tincture. Mix intimately, powder, and transfer at once to a well stoppered bottle.—Pharm. Jour. and Trans., Apr. 16, 1887, 843.

Extract Nux Vomica, B. P.—Examination of Commercial Samples, and Criticism of the B. P. Method of Standardizing.—See *Nux Vomica,* under "Materia Medica."

Extracts of Malt—Estimation of Diastatic Strength.—Mr. Charles H. Rex has estimated the diastatic strength of extracts of malt by the method of Mr. Carl Jungk (see Proceedings 1883, 54–55), with the results shown in the table. The Extractum Malti, U. S. P., and the Fluid Extract of Malt (Pennsylvania and National Formularies) were prepared by the author; with these, three samples of extract from different manufacturers were examined.

Form of Extract.	Amount of Malt Extract Employed.	Amount of Starch Converted.	Time Required.
Extractum Malti, U. S. P.	10 grams	10 grams	10 minutes.
Fld. Extract of Malt (Pa. & Nat. Form.) .	65 "	10 "	10 "
Commercial Extract	10 "	10 "	10 "
" "	40 "	10 "	10 "
" " in powder	100 "	10 "	10 "

The author has also experimented with the method of Dr. J. R. Duggan (see Proceedings 1886, 320), for the estimation of the diastatic value of extract of malt, and has estimated the free acid and the solid matter in the officinal extract. He finds this to contain 0.594 per cent. of free acid, and about 75 per cent. of solid matter.—Pharm. Rundschau, May 1887, 107–109.

Alcoholic Extract of Strophanthus—Preparation Without Preliminary Extraction of the Oil of the Seeds.—See *Strophanthus*, under "Materia Medica."

Ergotin—Decomposition of Solutions.—Mr. Engelmann presents the following conclusions as a result of elaborate bacteriological studies of ergotin:

1. Pure ergotin, unmixed, and dispensed in sterilized glass, may be preserved almost indefinitely.

2. Aqueous solutions of ergotin undergo a more or less speedy decomposition. This is due to the action of micro-organisms.

3. Such solutions, when introduced subcutaneously, induce varying degrees of inflammation.

4. The addition of antiseptic agents to such solutions, as ordinarily practised, only delays the decomposition.

5. In order completely to prevent the development of living ferments, the antiseptic must be added in quantities which are directly irritating, and which, in frequent use, are not indifferent in their action upon the organism of the patient.

6. Ergotin solutions may be quite far advanced in decomposition before the eye can detect such change.

7. Ergotin may be most advantageously administered subcutaneously, when di[illegible]olved in water previously sterilized by a half hour's boiling.

8. The solution may be best effected in the syringe itself.

9. The distilled water of the apothecaries usually contains bacteria, often to such an extent that from a single drop there may be cultivated upon the gelatin plate many thousands of colonies.

10. In all solutions of drugs to be used subcutaneously, it is therefore advisable that the water should be sterilized by prolonged boiling just previous to its use.

11. The decomposition of pure ergotin has been found to be due to bacterial impurities on the glass vessels used. A large number of micro-organisms cause decomposition in the solutions; the ordinary bacteria of decomposition, however, are the most active.—Deutsche medicinische Wochenschrift, Sept. 30, 1886; Amer. Jour. Pharm., Jan. 1887, 21.

EXTRACTA FLUIDA.

Fluid Extracts—Proposed Addition to National Formulary.—Mr. C. S. Hallberg observes that of nearly 300 unofficinal fluid extracts in use quite generally, only seven have been introduced in the provisional draft.

Selecting only those which are used on an average as often as the officinal fluid extracts, he recommends the addition of the following:

Extracta Fluida.	Derivation.		Menstrua.	
	Part used.	Scientific Name.	Alcohol parts by vol.	Water parts by vol.
Apii	Seed.	Apium graveolens.	90	10
Araliæ	Root.	Aralia racemosa.	50	50
Asclepias inc	Root.	Asclepias incarnata.	50	50
Asclepias tuber	Root.	Asclepias tuberosa.	75	25
Aurantii	Rind of fruit.	Citrus Aurantium.	90	10
Baptisiæ	Rhizome.	Baptisia tinctoria.	90	10
Bryoniæ	Root.	Bryonia alba.	90	10
Cascara Sagrada (1)	Bark.	Rhamnus Purshiana.	65	35
Dioscoreæ	Rhizome.	Dióscorea villosa.	75	25
Ergotæ (2)	Sclerotium.	Claviceps purpurea.	40	60
Eriodictyonis	Leaves.	Eriodictyon glutinosum.	80	20
Euonymi	Root-bark. *	Euonymus atropurpureus.	75	25
Fraxini Amer.	Bark.	Fraxinus americana.	50	50
Humuli	Strobiles.	Humulus Lupulus.	90	10
Juniperi (3)	Fruit.	Juniperus communis.	50	50
Lappæ	Root.	Lappa officinalis.	50	50
Phytolaccæ	Root.	Phytolacca decandra.	65	35
Pteleæ	Bark.	Ptelea trifoliata.	90	10
Quercus	Bark.	Quercus alba.	50	30 (4)
Sassafras	Root-bark.	Sassafras officinale.	90	10
Stillingiæ Comp	. . . .	. . . .	50	30 (4)
Trifolii (4)	Tops.	Trifolium pratense.	50	30 (4)
Ustilaginis	Fungi.	Ustilago maydis.	40	60
Zeæ Stigmatæ (5)	Stigmata.	Zea Mays.	20	80

* These are evidently transposed by typographical error, the root-bark of *Fraxinus americana* being the part used, as is the stem-bark of *Euonymus atropurpureus.—Rep.*

Respecting some of the above, the author makes some special remarks which are in substance as follows: (1) The bark should be neither too young nor too old, of medium thickness, and the interior of a light brown color. (2) The officinal menstruum is too strongly alcoholic, besides being objectionable in containing acid. (3) This is made by maceration and expression. (4) The addition of 20 parts (vol.) of glycerin is absolutely essential in these three, viz., Quercus, Stillingia Comp. and Trifolium. The formula for Stillingia Comp. is otherwise correct as given in the provisional draft (N. F. No. 184 (1). (5) This must be fresh; extracted by boiling water, concentrated to $\frac{4}{5}$ the volume, $\frac{1}{5}$ alcohol added, filtered, deficiency made to vol. for weight by 20 per cent. alcohol.—West. Drugg., June 1887, 189.

Fluid Extracts—Method of Standardizing by Mayer's Reagent.—Mr. Josiah K. Lilly communicates the result of experiments made to standardize fluid extracts by the aid of Mayer's reagent. He illustrates the method employed, as follows: A solution measuring 100 cc. represents 50 grams of ipecac, and was prepared by exhausting the powdered drug with alcohol by percolation, reducing the percolate to about 50 cc., adding 100 cc. of a 1 per cent. solution of sulphuric acid in water, carefully evaporating until all the alcohol was expelled, then adding water to make 90 cc., and a very little washed powdered pumice stone, agitating, and filtering through a plain paper filter, adding to same water to 100 cc. To make the test, 10 cc. of this solution, representing 5 grams of drug, are diluted with an equal volume of water, are titrated with 4 cc. of Mayer's reagent, it is allowed to stand a few moments, and a small portion filtered off. If Mayer's reagent produce a further precipitate, in the next experiment an increased quantity of the reagent is added; if no precipitate is produced, a smaller quantity is added, and in this manner the exact amount of reagent necessary for the complete precipitation of the alkaloid is eventually reached. It is very essential for the successful use of this method that all assays of the same drug should be conducted under precisely the same circumstances and conditions, such as dilution of solution, strength of acid used, and length of time allowed to elapse before filtering off for another addition of reagent. These all vary more or less in assays of different drugs, but should always be the same in different assays of the same drug. The following are some of the results obtained by this method, the number of cc. of Mayer's reagent being that required for 5 cc. of the fluid extract of each of the drugs named.

Aconite root	1.496 cc	Gelsemium	1.6 cc.
Belladonna leaves	2.4 cc	Hyoscyamus	1.8 cc.
Belladonna root	2.4 cc	Ipecac	4.0 cc.
Coca leaves	3.7 cc	Stramonium leaves	2.4 cc.
Colchicum root	1.75 cc	Stramonium seed	2.4 cc.
Colchicum seed	1.75 cc	Veratrum	2.1 cc.

The establishment of a standard is attained by testing in this manner a number of samples of the drug, and is illustrated by the author by the results obtained with 26 different samples of aconite root, the average of which is that given above.—West. Drugg., June 1887, 181–182; from Proc. Indiana Pharm. Asso., 1887.

Fluid Extracts—Causes of Precipitation.—Mr. J. Leroy Webber draws attention to the different causes that produce precipitates in fluid extracts, such as variations in the alcoholic strength of the percolates during different stages of the process, reduction of temperature during keeping, etc. Precipitates will occur to a greater or less extent in all fluid extracts, regardless of the highest skill and care. If these precipitates were formed at once, they could be removed once for all by filtration or by re-solution with a proper solvent; but their formation is gradual, and must therefore be prevented as far as possible by excluding air, preventing evaporation, and readjustment of alcoholic strength, etc.—West. Drugg., March 1887, 81–82.

Fluid Extracts.—Recovery of alcohol by the aid of a simple *Apparatus for Vacuum Distillation*, which see under "*Apparatus.*"

Fluid Extracts and Tinctures—Determination of Methyl Alcohol, which see under "Organic Chemistry."

Fluid Extract of Belladonna Root—Deposition of Sugar on Standing.—Mr. E. G. Eberhardt draws attention to the separation of cane-sugar in the containers of fluid extract of belladonna, on standing several days after its preparation. The author (very correctly—*Rep.*) argues that the sugar of the root is dissolved to its full limit by the alcohol during the percolation of the root, and that upon concentrating the percolates, the fluid extract being strongly alcoholic, the sugar gradually crystallizes out.—West. Drugg., April 1887, 110.

Fluid Extract of Ergot—Efficiency of the U. S. P. Formula.—Mr. E. C. Federer communicates the results of a series of experiments undertaken with a view to determine whether the fluid extract of ergot can be improved, either by the preliminary extraction of oil, by the use of modified menstrua, or both. His results are given in form of a tabulated statement, and show that the U. S. P. preparation, to judge from our present knowledge of the subject, forms the best preparation of those that the author had made. For hypodermic use a preparation made similar to that of the B. P. liquid extract, seems to serve a good purpose.—West. Drugg., Nov. 1886, 408–409.

Fluid Extract of Squill—Preparation with Diluted Acetic Acid.—Prof. J. U. Lloyd, who has had an experience in the manufacture of fluid extract of squill antedating its introduction into the Pharmacopœia by many years, criticises the officinal formula and gives facts which make it doubtful whether the alcohol completely extracts the squill. He expresses the opinion that diluted acetic acid will serve the purpose much more perfectly, provided the finished product be made to represent only half the quantity of squill, viz., 1 p. squill in 2 p. by volume of fluid extract. It is not at all necessary to reduce the squill to powder, either coarse or fine, for this purpose. The sliced squill is macerated in the diluted acetic acid, expressed by strong pressure, the vinegar evaporated to such volume that one troy ounce of squill shall be represented by two fluidounces. To the syrupy liquid one-half the bulk of alcohol is added, and, after some days, the product is filtered. This produces a preparation having a syrupy consistence, an acid, slightly acrid (not bitter) taste, and a color that ranges from light amber to dark brown-red, in accordance with certain features which the author has considered in his paper on "Evaporation of Percolates" (see Proceedings 1886, 38–40.) Such a fluid extract will practically represent one-half of its bulk of squill, if the menstruum is, as he believes, the proper one, and if the heat has not destroyed the valuable constituents, of which, also, he believes there is little danger under the exercise of proper care with pharmacopœial quantities.—Amer. Drugg., November 1886, 202–203.

Fluid Extract of Veratrum Viride—Alkaloidal Valuation.—Mr. H. W. Snow has made some interesting experiments on the alkaloidal valuation of fluid extracts of veratrum viride. He has, however, not yet arrived at any satisfactory results, though the observations made will greatly aid in the development of a practical method of assay. Reference may be had to the original paper in Proceedings Michigan Pharm. Asso., 1886, or in Pharm. Era, Jan. 1887, 11–13.

Fluid Extract of Yerba Santa—Preparation.—Mr. R. Rother suggests the following formula for a fluid extract of eriodictyon leaves, which is based upon his observations respecting the constituent that possesses the property of disguising the taste of quinine. (See *Yerba Santa*, under "Materia Medica):—

Yerba Santa leaves, coarsely ground	16 Troy ounces.
Potassium carbonate	3 "
Ammonia water,	
Alcohol,	
Water, of each sufficient to make one pint.	

Mix ammonia water and water in the proportion of one measure of the first and seven measures of the second. Mix the yerba santa with eight fluidounces of this mixture, and pack it firmly into a cylindrical glass percolator. After due maceration pour on menstruum until 3 pints of percolate has slowly passed. To this add the potassium carbonate and evaporate it until a pasty residue is left. Stir this well with 8 fluidounces of alcohol gradually added; let the pasty precipitate subside and decant the supernatant liquor. To the residue gradually add 8 fluidounces of alcohol as before, pour this mixture upon a strainer and force the liquid out. Should this second extraction measure more than is needed to complete the intended volume of fluid extract, dissipate the excess of alcohol by appropriate means; unite the residue with the first extraction, set the mixture aside for twenty-four hours, and decant the clear fluid extract from the scant crystalline deposit meanwhile formed.—Amer. Jour. Pharm., May 1887, 225–227.

Fluid Extract of Ulex Europæus—Preparation.—During his experiments on the alkaloid of *Ulex Europæus*, *Ulexine*, (which see under "Organic Chemistry") Mr. A. W. Gerrard has made some experiments to determine the best manner of making the galenical preparation from the seeds. Neither ether nor strong alcohol are adapted as simple menstrua, but by exhausting the drug with 84 per cent. alcohol, distilling off the alcohol, extracting the residue with dilute hydrochloric (as is done in his process for preparing ulexine), then neutralizing with soda, and evaporating the quantity from each weighed pound to 12 fluidounces, and making up with spirit to the measure of 16 fluidounces, a very satisfactory fluid extract is obtained.—Year-Book of Pharmacy, 1886, 461.

Liquid Extract of Pomegranate Bark—Method of Making an Agreeable Preparation.—It is stated in Pharm. Zeit. f. Russl. (xxv. 707), that by the following method a liquid preparation of pomegranate root-bark is obtained, which is devoid of the astringency and disagreeable taste of the bark. The quantity indicated is sufficient for one dose. Digest 170 grams of pomegranate root bark with water slightly acidulated with acetic acid at a temperature of 70° C. for 12 hours, and repeat the operation twice; then having mixed the liquids, precipitate with acetate of lead, remove the excess of lead by HS, and evaporate the filtrate to a syrupy consistence.

Fluid Extract of Cinchona Bark—Suggestion as to its Preparation with Water.—For the preparation of fluid extract of cinchona with water only, Mr. A. C. Abraham has always advocated the employment of that water at, or near, the boiling temperature. This preference, together with the very suggestive article of Dr. Paul (see Proceedings 1886, 322), prompted him to undertake a series of experiments, from which he has drawn the following conclusions:

1st. That if we want to have a fluid extract representing as far as possible the bark from which it is made in an unaltered state, we should certainly let water do what it can, and then, if we wish to add an acid solution of the cinchona alkaloids to it, treat the residue with an acid menstruum.

2d. That in the latter case the acid menstruum should be at least double the strength of that ordered by the Pharmacopœia.

The author's preference for boiling water is not founded upon any experiments with such barks as are now officinal (in the B. P.), but with the old flat calisaya. He has, however, every reason to believe that what holds for the one holds for the other, and that in either case a given quantity of boiling water will remove more than can be removed by cold water.—Pharm. Jour. and Trans., April 30, 1887, 897–898.

Fluid Extract of Wild Cherry—Modification of the U. S. P. Process.—M. Cyrus M. Boger considers that the chief objects to be attained in making the fluid extract of wild cherry are: The development of all the hydrocyanic acid that the bark is capable of yielding, the exclusion of tannic acid as far as possible, and the prevention of a precipitate. None of these conditions are, however, fulfilled by the officinal process, because the time allowed for maceration is too short, the addition of glycerin hinders the development of the hydrocyanic acid, and the drug is not sufficiently moistened to effect this development satisfactorily. To overcome all the objections mentioned, the author suggests the following formula, which yields a fluid extract that does not precipitate, and contains all the available hydrocyanic acid:

Take of

Ground Wild Cherry Bark	℥ xvj.
Water and Alcohol, each	f℥ x.
Glycerin	℥ iv.

Moisten the bark with ℥x of water and put loosely in the percolator, close tightly, and allow it to macerate sixty hours; then pack very firmly, mix the ten fluidounces of alcohol and four of glycerin and pour it upon the bark; now cork up the percolator tightly and macerate twenty-four hours longer, at the expiration of this time remove the cork, and about twelve fluidounces of percolate will come through; water should now be poured on to force the other four fluidounces out, when the percolation should be stopped and the product will be finished. After an extended experience the conclusion was reached that to continue the percolation beyond this point is worse than useless, as it necessitates subsequent evaporation; nor does it add any medicinal strength to the preparation. It does add quite a considerable quantity of tannin and gallic acid, which latter results from the conversion of the tannin by heat.—Amer. Jour. Pharm., May, 1887, 231–232.

INFUSA ET DECOCTA.

Infusions of the B. P.—Influence of the Change Directed by the Pharmacopœia of 1885.—Mr. R. A. Cripps observes that no class of preparations has been more changed during the revision of the British Pharmacopœia (1885) than that of the infusions. He has made numerous experiments to determine the influence of these changes upon the resulting preparations, which demonstrate that in those cases in which the time has been reduced, without any other modification, there has been, except in the case of bearberry, a decrease in the solid residue, in some instances a considerable one; there has, however, been no great difference in physical properties. The

Infusions of Digitalis and Gentian show a diminution about equivalent to the decrease in the proportion of the drug ordered in the new formula. The influence of the finer division of the drugs, however, is to considerably increase the activity of the resulting preparations. Thus,

Infusion of Cascarilla, for which a finer powder is directed by the Pharm. of 1885, was fully one-third stronger than that of the Pharm. of 1867. In the case of

Infusions of Cinchona, a strict comparison is impossible, on account of the great variation in the yellow and red barks. The author's experience tends to show that the effect of a finer powder is not very marked, an increase of about 3 per cent. only of the total alkaloids being noted in favor of the finer powder. The greatest difference, however, is caused by the acid, the infusions containing it being fully half as strong again (in alkaloids) as the strongest of the others. In the case of

Infusion of Krameria, the effect of the finer division of powder is very marked, but practically a No. 20 powder would have been more suitable, on account of the difficulty to reduce the root to the condition of a No. 40 powder.

The author's paper is accompanied by two tables, the first showing the alterations in the new Pharmacopœia; the second showing the influence of the alterations.—Pharm. Jour. and Trans., Nov. 13, 1886, 385–387.

Infusum Sennæ Compositum—Modification of Process.—Mr. H. Noffke recommends the following process, which, while somewhat troublesome, produces a preparation that will keep well in a cool place for several months, and which is particularly adapted to pharmacies in which this preparation is in regular demand. 50 p. of senna are digested with 500 p. of boiling distilled water for five minutes on a steam bath, allowed to cool, the infusion is strained off, and the residual leaves gently expressed. 50 parts of sodio-potassic tartrate and 100 p. of manna are dissolved in the strained liquid, and the whole set aside for 24 hours, when the clear liquor is decanted, the rest strained through a woolen cloth. It is then heated to boiling in a tinned copper kettle with a magma of 2 p. filter paper and 75 p. water, strained and expressed, and filtered while hot. It is finally evaporated to 400 parts and filled in vials of appropriate capacity (50, 100 or 200 grams), observing that the liquid shall reach half way up the neck. Two or three drops of alcohol are dropped on the surface, and the vial is then well corked and kept in a cool place.—Arch. d. Pharm., Aug. 1886, 670; from Pharm. Ztg., 31, 592.

Decoction of Uva Ursi—Necessity of Finely Cut Leaves to Insure Thorough Extraction.—Mr. E. Mylius draws attention to the fact that when bearberry leaves are employed whole or coarsely cut, as is customary (in Germany), the resultant decoction is very light colored. This is due to the thick cuticle of the leaves, which is with difficulty penetrated by the water. To secure a strong and active decoction, he recommends that the leaves be cut extremely fine, to moisten the comminuted leaves with about one-half their weight of alcohol, and after standing ten minutes to prepare from the so treated leaves the decoction in the usual manner. The treatment with alcohol causes the cuticle to become readily penetrable, and the intermediate portions susceptible to the action of the water.—Arch. d. Pharm., Dec. 1886, 1025; from Pharm. Centralb., 1886, 27, 515.

LINIMENTA.

Belladonna Liniment, B. P.—Modifications of the Methods of Extraction, etc.—Mr. Francis Ransom criticises the directions of the B. P. for the preparation of belladonna liniment. He finds that by employing the fine powder directed by the Pharmacopœia a considerable inconvenience is encountered when working on a large scale. He employs a No. 20 powder, and by combining expression with percolation finds that from 20 ozs. of belladonna root 30 fl. ozs. of liniment can thus be readily obtained with a total expenditure of 40 fl. ozs. of rectified spirit; whereas, when following the officinal direction, 54 fl. ozs. were found to be necessary. The liniment obtained by the improved method was almost identical with that made by the officinal process. In neither case, however, is the exhaustion of the root complete, only from 63 to 71 per cent. of the total alkaloid contained in the root being represented in the liniment. His experience leads him to favor the standardizing of the preparation.—Yearbook of Pharm., 1886, 518–524.

Liniment of Belladonna—Preparation from Standard Extract.—The following formula is suggested by Messrs. Dunstan and Ransom: Take of standard extract of belladonna (see under "Extracta"), 3 ounces; camphor, 1 ounce; rectified spirit, 24 fluidounces; distilled water, 6 fluidounces. Dissolve the camphor in the spirit and the extract in the slightly warmed water. When cold mix the two solutions, allow any undissolved sugar of milk present to subside, and pour off the clear liquor, which should measure 30 fluidounces. One hundred fluid grains of this liniment contain ⅕ grain (=0.2 per cent.) of total alkaloid.—Pharm. Jour. and Trans., April 16, 1887, 844.

Linimentum Terebinthinæ, B. P.—Necessity of More Water in the Formula.—Mr. Michael Convoy points out that if the formula of the B. P. for linimentum terebinthinæ is strictly followed, a fine jelly-like liniment may be produced, provided the soap and water (2 ounces and 2 fluidounces respectively) be well incorporated, and the oil of turpentine (16 fluidounces), holding the camphor (1 ounce) in solution, added very slowly with constant trituration. The quality of the soap and oil of turpentine does not affect the result. If, however, a liquid preparation is required, it becomes necessary to increase the quantity of water to 4 fluidounces.—Pharm. Jour. and Trans., Nov. 27, 1886, 434.

Linimentum Terebinthinæ.—Mr. W. Charles Baker has also found difficulty in uniformly making a satisfactory liniment, but in his experience the difficulty is not so much due to an insufficiency of water, as found by Mr. Conroy, but to the manner of manipulating. He recommends that after mixing the soap and the water together, the turpentine solution of camphor should be added very gradually at first, until an emulsion is formed, then in quantities at a time, and the whole stirred with the pestle until thoroughly mixed. If it be added too gradually after the emulsion is formed, a stiff jelly will be the result.—Ibid., Jan. 29, 1887, 619.

Linimentum Terebinthinæ.—Professor Redwood, referring to the recently published papers on the subject of this liniment (see above), communicates a lengthy paper in which he defines the characters of the liniment as well as of the "sapo mollis" (which see) to be employed. The conclusions arrived at by him are to the effect, "that the officinal formula for *linimentum terebinthinæ* yields a thick permanent emulsion, well suited for its intended use, if prepared with a soap that is neutral or nearly free from alkalinity; but that the definition of *sapo mollis*, as given in the Pharmacopœia, requires correction and otherwise admits of improvement. —Pharm. Jour. and Trans., March 12, 1887, 742.

Linimentum Terebinthinæ—Suggestion as to Preparation.—Mr. George E. Perry also contributes a paper on the turpentine liniment of the B. P. He finds it best to add the soap and water to the solution of camphor in oil of turpentine contained in a bottle, and then shaking well. Even with the Pharmacopœia's proportion of soap and water, a good liniment is then obtained; but as the result of his experiment he finds the use of 4 oz. of the soap and 1 oz. of water to give the preferable result. The additional quantity of soap, he thinks, cannot be objected to, seeing the value that of late has been attached to action of oleates on the skin, while pharmaceutically the preparation leaves little to be desired.—Pharm. Jour. and Trans., April 30, 1887, 899.

Oleum Hyoscyami—Improved Process.—Mr. E. Dieterich (Helfenberger Annalen, 1886), having determined that the alkaloids of hyoscyamus, in their free state, are readily held in solution by fixed oils, has formulated the following process for the preparation of oleum hyoscyami: 1000 grams of hyoscyamus, in moderately fine powder, are thoroughly moistened with a mixture of 750 grams of alcohol, and 20 grams of liq. ammon. caust. (Ph. Germ.), pressed into a porcelain jar, well covered, and allowed to stand 12 hours. The powder is then stirred with 5000 grams of olive oil in a porcelain capsule and digested, with occasional stirring, for 10 hours, at a temperature of 50–60°. It is then expressed and filtered. The author had determined that in the oleum hyoscyami prepared by the method of the Germ. Pharm.* only a small proportion of the

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* Possibly by the improved method suggested last year by Mr. Dieterich.—*Rep.* See Proceedings 1886, 328.

hyoscyamin enters into the solution. By his above method a product is obtained that contains three times as much.—Arch. d. Pharm., June 1887, 495–496.

Anti-neuralgic Liniment.—Dr. Guéneau de Mussey recommends the following mixture as an anti-neuralgic liniment: Oil of peppermint, 5 p.; tincture of aconite root, 2 p.; chloroform, 1 p.—Amer. Jour. Phar., Nov. 1880, 536.

Liniments—Various Practical Formulas.—A "Practical Pharmacist" communicates the following formulas for liniments to Drug. Circ., Dec. 1886, 268.

FIRST FORMULA.

Oil sassafras	8 fl. ozs.
Oil wintergreen	2 "
Sulphuric ether	8 "
Tr. aconite root,	8 "
Camphor	8 ozs.
Alcohol	q. s. to make 1 gallon.

Use as it is or color red if desired, with red saunders or alkanet root. The tincture of aconite should be *entirely* alcoholic.

SECOND FORMULA.

Oil sassafras	8 fl. ozs.
Chloroform	16 "
Camphor	8 ozs.
Olive oil	3½ pints.

Spirit turpentine sufficient to make one gallon.

THIRD FORMULA.

Oil origanum	8 fl. ozs.
Oil cajeput	4 "
Alcohol	3¼ pints.
Soap liniment	4 "

FOURTH FORMULA.

Camphor	8 ozs.
Chloroform	16 fl. ozs.

Alcohol sufficient to make one gallon.

IODIDE OF AMMONIUM LINIMENT.

Tincture iodine	4 fl. ozs.
Hyposulphite sodium	1 "
Water	4 "
Water of ammonia	14 "
Chloroform	16 "
Tr. aconite root	12 "
Alcohol	78 "

Dissolve the hyposulphite of sodium in the water and add the tincture of iodine; then add the aqua ammonia; finally add the chloroform, tr. aconite root and alcohol, previously mixed.

HORSE AND CATTLE LOTION.

Camphor	1 lb.
Oil of origanum	1 pint.
Water of ammonia	1 "
Sweet oil	3 pints.

Crude petroleum sufficient to make one gallon.

Dissolve the camphor in sweet oil and add the other components.

NERVE AND BONE LINIMENT.

Camphor	12 oz.
Oil sassafras	8 fl. ozs.
Oil origanum	8 "
Water of ammonia	12 "
Chloroform	8 "
Sweet oil	3 pints.
Oil of seneca (crude petroleum)	3 "

LIQUORES.

Solution of Citrate of Magnesium—Modification of Formula.—So much has been written upon the subject of this solution that it seems almost superfluous to report further on the same. Nevertheless here is the formula based on the experience of, and proposed by Mr. F. W. Sennewald:

Take of

Citric acid	23¾ av. ozs.
Powdered carbonate magnesium	11 "
Granulated sugar	24 "
Oil of lemon, fresh	90 min.
Water	1 gal. 6 pints, 9 fl. ozs.

Pour the oil on the sugar and magnesia, and mix well with a glass rod or wooden spatula, add the acid and water, and stir the whole from time to time. When the mixture has become clear, filter through white filtering paper; divide the liquid in twenty-four bottles, add to each bottle 30 grains of Merck's crystallized bicarbonate of sodium, cork immediately, and tie in the usual manner. No other bicarbonate answers as well. The bicarbonate of potassium is ordained by the Pharmacopœia, but as found in the market it usually produces floccules; and powdered bicarbonate of sodium, although pure, gives off its carbonic acid gas too rapidly to admit proper time for corking.—Nat. Drugg., May 6, 1887, 214.

Solution of Citrate of Magnesium—Addition of Boric Acid to Secure Permanence.—Mr. Reeb states that solution of citrate of magnesium is less likely to show a precipitate when the carbonate is added to the acid than when the acid is added to the carbonate. He also gives a formula for concentrated citrate of magnesium as follows: boracic acid 100, citric acid 600, carb. magnesium 360, distilled water 4000. This, he says, keeps unchanged even in winter.—Bull. Com., May 1887.

Liquor Magnesii Bromidi—Formula.—Mr. Joseph W. England communicates the following formula for a solution of bromide of magnesium, which has been successfully employed in the Philadelphia Hospital, particularly in the insane department:

Take of
Acid. hydrobromic. dilut. (U. S. P., 1880) . . . . 1 pint.
Magnes. carb. 9.5, to neutralize (or about one troy ounce).
Filter.

Each teaspoonful contains 7 (exactly 6.97) grains of anhydrous magnesium bromide. Dose: One to two fluidrachms. It is a clear, transparent, light-yellowish liquid; odorless, bitter, and brackish in taste. Specific gravity 1.122, miscible with alcohol in equal volumes without precipitation, and remaining unaltered upon exposure to air. One fluidounce of the solution, precipitated with a slight excess of sodium carbonate, and then ignited, should yield not less than 12 grains of magnesium oxide.—Amer. Jour. Pharm., Nov. 1886, 531–533.

Liquor Kali Arsenicosi, Ph. G.—*Clarification.*—According to "Pharm. Centralh.," this solution may be rapidly and permanently clarified, without affecting the amount of arsenious acid in it, by adding 0.5 gram kaolin to 200 grams of the solution, shaking, and allowing the kaolin to subside. After several days' standing, the solution is filtered.—Arch. d. Pharm., March 1887, 220.

Lime Water—Necessity to Avoid Filtration.—Mr. J. Innes Frazer has observed that of the same lot of limewater, which had been drawn off clear by the siphon contained an amount of lime equivalent to 6.16 grs. CaO in ten fluidounces, whilst a portion that had been filtered through paper contained only 5.26 grs. He regards it important that the lime water should be kept in as cool a place as possible.—Pharm. Jour. and Trans., March 26, 1887, 782–783.

Liquor Ferri Chloridi, U. S. P.—*Oxidation by Means of Hydrogen Dioxide.*—Mr. August Drescher observes that the use of nitric acid as an oxidizing agent in the process for preparing solution of ferric chloride is objectionable on several grounds, and proposes hydrogen dioxide as a substitute. The ferric solution is prepared in the usual way, the necessary hydrochloric acid added, and then hydrogen dioxide is introduced gradually, and heat is applied. The reaction is very simple, thus:

$$2FeCl_2 + 2HCl + H_2O_2 = Fe_2Cl_6 + 2H_2O.$$

The ferricyanide test is applied to make sure that complete oxidation has taken place. The solution is then brought to the proper specific gravity. The hydrochloric acid to be used for the preparation of liquor ferri chloridi must be of proper strength (which is often not the case); it is useful to take the specific gravity of it, in the first place, and from this find, by consulting Kolb's tables, the amount of HCl in it, and thus work with an acid of known strength; or the strength of the acid may be found by titrating with volumetric alkali solution.

Hydrogen dioxide is a readily obtainable article, and its cost is relatively low. The quantity to be used is easily calculated; every 2 molecules of $FeCl_2$ requiring 1 molecule H_2O_2, and the solution of H_2O_2 being of a known percentage strength.—Drugg. Circ., Jan. 1887, 4.

Liquor Ferri Chloridi—Contamination with Arsenic.—Mr. Geo. Buchner observes that commercial solution of ferric chloride is often contaminated with arsenic, probably as arsenic acid or ferric arsenate. The Pharmacopœias do not give a test for this impurity, which is readily detected by treating a small quantity of the liquor with zinc and hydrochloric acid, when the hydrogen gas will produce a yellow, brown, or black color upon paper moistened with silver nitrate. Ferric compounds, prepared from such a liquor, will likewise contain arsenic. In testing for arsenic by Marsh's process, the author directs attention to the necessity of heating the reduction tube sufficiently, since by the use of a Bunsen burner an arsenical mirror will be readily obtained, while with the same materials the mirror may not make its appearance on prolonged heating with a Berzelius' spirit lamp.—Chem. Ztg., 1887, 417.

Liquor Ferri Acetatis—Method of Facilitating the Washing of Ferric Hydrate.—In preparing solution of ferric acetate, Mr. Oldtmann collects the precipitated hydrated oxide of iron on a strainer and allows it to freeze; this mass after melting can be readily washed and pressed. Solution of acetate of iron thus prepared is clear and stable. Amer. Jour. Pharm., June 1887, 301.

Liquor Ferri Dialysati—Concentration by Freezing.—A writer in "Pharm. Rundschau (Prag.)" (1887, 90) observes that this liquor as frequently obtained has not the proper specific gravity. By subjecting it to freezing temperature the water will freeze out. In this way solution of dialyzed iron can readily be concentrated without decomposition.

Liquor Ferri Albuminati—Preparation.—Mr. R. Buwa communicates (in Pharm. Zeitsch. f. Russl.) the following formula for preparing liquor ferri albuminati: 30 grams of dry egg albumen are dissolved in 4 to 5 times the quantity of water, and 6 grams of liquor ferri sesqui-chlorati diluted with 24 grams of water, are added. After the precipitate, which forms preliminarily, is redissolved, the albuminate of iron is precipitated by a solution of 60 grams of common salt, washed well, and dissolved in sufficient of a mixture of 1 part of aqua cinnamomi and 2 parts of glycerin to make the resultant solution weigh 270 grams; the solution is then accurately neutralized with solution of potassa, and finished by the addition of 1 drop oleum cinnamomi.—Arch. d. Pharm., Jan. 1887, 35.

Solution of Chlorinated Soda—Deficiency of Soda.—A correspondent of the "Western Druggist" (March 1887, 80) draws attention to the deficiency of soda in the preparation of the Pharmacopœia of 1880. In this the relation of carbonate of soda to chlorinated lime is 10:8, and the resulting preparation always holds a certain amount of calcium salt in solution. In the Pharmacopœia of 1870 the proportion was 16:8, and this the author considers the proper one. He offers some practical remarks respecting the selection of material, etc.

Solution of Chlorinated Soda—Advantage of Adding Glycerin.—It is stated in "Chem. Tech. Centr. Anzeiger" (iv. 839,) that the addition of a small quantity of glycerin to a bleaching mixture of chlorinated lime and soda makes the fabric whiter, prevents action on the fibers, and obviates the necessity of using acid to remove the chlorinated lime.

Lugol's Solution—Use as a Reagent for Alkaloids and Leucomaïnes in Human Urine.—Messrs. Chibret and Izarn explain a new mode of using Lugol's mixture in seeking for fortuitous alkaloids and leucomaïnes in human urine—matters in which the wise physician often seeks the aid of the analyst. They found that the unvarying reaction in the presence of alkaloids, gave rise to a green fluorescence, and that this acquires an exceptional visibility under the solar ray or in the lantern. The temperature of the liquid is important. Urine which shows nothing when emitted, gives a clearly perceptible reaction when cold. A concentration of the usual reagent into the following formula gave the best results: Iodine 8; potass. iod. 8; water 10. Urine emitted eight hours after waking, showed five times the quantity of alkaloids found at other seasons, thus confirming Bouchard's observations on the maximum toxicity of alkaloidal urines.—Rev. des Sci. Med., April 15, 1887.

Fehling's Solution—Application to Various Purposes in Urine Examinations.—Mr. Jolly finds that Fehling's solution answers well for the determination of peptones, excess of uric acid, and excess of phosphoric acid, as well as glucose in urine. 1 cc. of the solution is mixed with 10 cc. of the urine, and the mixture is heated until it begins to boil. If a pale yellow flocculent precipitate is produced, leaving an amber-colored liquid, *peptones* are present. An orange-yellow liquid and precipitate is indicative of *glucose.* When equal volumes of the solution and of urine are heated to boiling, the liquid remains blue and a small quantity of bluish-grey deposit is formed if uric acid is present in small quantity; but if the liquid assumes a green color and the precipitate a greenish-grey, an excess of *uric acid* or *urates* is present. A large amount of precipitate under these conditions is indicative of much *phosphoric acid* in the urine.—Arch. d. Pharm., July 1886, 600; from Jour. Pharm. Chim., 1886, 388.

Liquor Hydrargyri Nitratis—Inaccuracy of the Officinal Formula.—Mr. Frank X. Moerk draws attention to the fact that the officinal formula for solution of mercuric nitrate will yield a liquor containing

60% of mercuri nitrat, anb not 50% as desscribed. If a 50% solution is required 33.32 p. of mercuric oxide instead of 45 p. should be used; but this will leave the acid in greater excess than is at present the case On calculation he finds that this excess in the present liquor is 25% above the quantity required to form the nitrate, and if this is the excess desired, the formula sould be constructed as follows:

Mercuric oxide	33.32 parts.
Nitric acid	37.38 "
Distilled water	29.30 " or
q. s. to make 100 parts.	

—Amer. Jour. Phar., Dec. 1886, 577-579.

Solution of Mercuric Chloride—Permanent Solution.—Dr. A. C. Bernays states on the authority of Dr. Stuetz, that by adding 7½ grains of citric acid to each quart of water used in making solution of bichloride of mercury there would be no reduction of the $HgCl_2$, and also no precipitate when albuminoid solutions are admixed.—Weekly Med. Rev., May 14, 1887, 558.

Mercuric Injections—Experience in their Use.—Dr. Sirsky reports 300 cases treated with 7000 hypodermic injections of mercury. Stomatitis very rarely appeared and no abscesses were formed. In five cases there was superficial cutaneous gangrene, caused by penetration into the true skin. Sirsky injected but 15 centigm. of mercury to the dose, and used soluble salts exclusively. To make the injections wholly painless he sometimes added to the mercury solution a solution of 1 to 100 of cocaine nitrate. —Bull. Gén. de Thérap., May 30, 1887.

Liquor Chloroformi Compositus (Chlorodyne)—Modified Formula.—Mr. B. L. Maltbie recommends the following formula: Morphine hydrochlorate, gr. 16; alcohol, fl.dr. 12; tincture of cannabis ind., fl.dr. 4; oil of peppermint, minims 6; tincture of capsicum, minims 15; chloroform, fl. dr. 4; dilute hydrocyanic acid, fl. dr. 1; glycerin, sufficient to make 4 fluidounces. The morphine is dissolved in the alcohol, and the other ingredients are added in the order named. The formula has proved most satisfactory.—West. Drugg., Nov. 1886, 399-400.

Chlorodyne—Review of Formulas.—Mr. C. S. Hallberg communicates a critical review of different formulas for chlorodyne, and furnishes a tabulated exhibit of the composition of this article as made by sixteen different formulas. He concludes that Mr. Maltbie's formula (see above) is by all odds to be preferred over all others, being a happy compromise in the proportion of the active ingredients, as well as those of lesser importance, while the vehicle employed, glycerin, is far superior in making an eligible mixture to those of syrupy or mucilaginous character.—West. Drugg., April 1887, 108.

Liquor Strychniae, B. P.—*Liability to Deposit Strychnia in Cold Weather.*—Mr. E. H. Farr had his attention attracted to a sample of liq. strychn., B. P., which had been sent out in the ordinary course of business, and which on keeping had deposited crystals. Examination proved these crystals to be hydrochlorate of strychnine, and that the remaining liquor had retained only 0.815 per cent. instead of the 1 per cent. it should properly contain. The author records a number of experiments to determine the cause of the deposition, and concludes that it is due to the influence of the low temperature at which the liquor had been kept during a certain period. He therefore enjoins upon pharmacists the necessity of keeping the solution in such place that it may not be exposed to too low a temperature.—Pharm. Jour. and Trans., Jan. 15, 1887, 580–581.

Colorless Hydrastis—Examination of Commercial Samples.—Mr. Gust. Steinmann has examined three samples of colorless hydrastis from different manufacturers. He found in No. 1 the alkaloid as sulphate in a mixture of glycerin and water having the specific gravity 1.15, and giving after ignition 0.05 per cent. ash. In No. 2 two acids were present, hydrochloric and sulphuric, combined with the alkaloid, aluminium, and a trace of potassium; specific gravity, 1.13; ash, 0.35 per cent., which gave 0.12 per cent. aluminium oxide, showing that the alkaloid is present as chloride and aluminium as sulphate. The potash alum; probably, was used in the process of decolorizing, or to prevent the method of manufacture becoming known. In No. 3 the alkaloid was present as a chloride; also found boracic acid; specific gravity 1.12. There being organic matter present, it was difficult to reduce to ash. Samples were prepared; one containing 20 grains of hydrastine-sulphate in a solution of glycerin and water having the specific gravity 1.15, which answered the tests of No. 1, and, no doubt, is identical. Another was prepared containing 20 grains of the chloride of hydrastine with alum, which gave characteristic tests as in No. 2, with the exception of the ammonia test, which gave a precipitate of less bulk. The third was prepared from the chloride with boracic acid, which gave characteristic tests, but the ash was not as difficult to obtain.—Amer. Jour. Pharm., June 1887, 276–277.

MELLITÆ.

Mel Depuratum—Preparation.—Mr. O. Kaspar recommends the following process for preparing purified honey: 1 kg. honey is heated for half an hour with 4 kg. water on a water-bath at the boiling temperature, 10 g. each of powdered wood-charcoal and fragments of blotting paper are added, and the heating is continued half an hour. The mixture is allowed to stand 24 hours, filtered, the clear filtrate evaporated to 1 kg. and the sp. gr. having been preliminarily determined, brought by the addition of more water if necessary, to the sp. gr. 1.32. Honey having the sp. gr. 1.30 will not keep, while at a sp. gr. 1.33 it is liable to crystallize. The honey so obtained is golden-yellow, perfectly clear, has a good aroma, and is free from foreign substances, while these latter are always present to a greater or less extent when bolus, magnesia, tannin, etc., are used as clarifying agents. The author observes that the requirement that honey should be free from acidity and that it should be completely soluble in alcohol, is incorrect, since certain natural honeys always form a turbid solution and even precipitate with alcohol, while even the best honey has an acid reaction.—Arch. d. Pharm., Feb. 1887, 131; from Schw. Wochenschr. f. Pharm.

MISTURÆ.

Emulsification—Explanation of a Theory.—Mr. Wm. Gilmour observes that the object of the general advice to stir emulsions in one direction has been explained to him by a prominent authority on the theory that when the oil is stirred in one direction it is, as it were, drawn out into thin threads, whilst the reverse motion has a tendency to reunite it into globules. Microscopic experiments made by the author have tended to confirm this theory, but he found that as far as the final emulsionizing was concerned, it was indifferent whether the stirring was constantly in one direction, or was alternately reversed, except in so far as it required a somewhat longer time under the latter condition to effect a perfect emulsion.—Pharm. Jour. and Trans., March 26, 1887, 781.

Emulsions—Preparation.—Professor Charles T. P. Fennel has tried the processes for emulsion of cod-liver oil and of castor oil, etc., adopted in the New York and Brooklyn Formulary, and, though following the directions explicitly, has uniformly failed to secure emulsions that would not readily separate on standing. He recommends a proportion of oil, gum and water which has hitherto been recommended by others for fixed oils, balsams and oleo-resins, viz: oil 1; gum ½; water ¾. A perfect emulsion is quickly made. For volatile oils he states that a larger amount of gum is required (? Rep.) viz: oil 1; gum 1 to 1½; water 1 to 1½.—Amer. Drugg., July 1886, 125.

Emulsions—Use of Casein for their Preparation.—See Casein, under "Organic Chemistry."

Emulsion of Cod Liver Oil—Comparison of Formulas.—Mr. C. S. Hallberg has made emulsions by the modification of the New York and Brooklyn formulas as contained in the preliminary draft of the N. F. Committee, by the formula recommended by the Ky. Phar. Assoc., and by the formula of the Ills. Pharm. Assoc. He exhibits micro-photographic illustrations of the three emulsions, which clearly show the formula of the Ky. Association to secure the most perfect division of the oil. This formula directs 8 parts oil, 2 parts gum arabic, and 3 parts water, all by weight.—West. Drugg., Jan. 1887, 6–7.

Emulsions of Cod Liver Oil—Preparation.—Mr. Henry Schmid has made emulsions of cod liver oil by different methods, and has compared them microscopically and otherwise among themselves and with proprietary emulsions, his paper being illustrated by eight micro-photographic views. None of the methods seem to produce perfect emulsions. In a note to this paper the editor of "Amer. Drugg." observes that "after all, the old fashioned method, in which the proportions are: Oil 4, gum 2, water 3, appears to furnish the most reliable results."—Amer. Drugg., November 1886, 201–202.

Emulsion of Cod Liver Oil—Preparation with Irish Moss as Emulsifier.—Mr. Adolph Tscheppe recommends the following, which he considers a formula that requires neither skill, care, nor labor—in fact hardly any formula is, in his opinion, needed, all that is necessary being the request to make an emulsion of cod liver oil with Irish moss:

Irish moss, 1 dram; make a decoction (or solution) in a water-bath, strained, 5 fl. ounces. Add glycerin, 2 fl. ounces; alcohol, 1 fl. ounce; oil of bitter almond, 5 drops; oil of wintergreen, 3 drops. Mix. When cold add cod liver oil, 8 fl. ounces, in three portions, shaking vigorously after each addition.—Pharm. Rec., March 15, 1887, 82.

Ferrated Cod Liver Oil—Simple Method of Preparation.—Instead of resorting to the circumstantial method, such as with benzoic acid, etc., usually recommended for the preparation of ferrated cod liver oil, Mr. E. Mylius recommends that a cod liver oil soap be precipitated by ferric chloride, and the iron soap so obtained dissolved in cod liver oil. The product is neither bitter nor acrid to the taste. Arch. d. Pharm., Dec. 1886, 1025; from Pharm. Centralh., 1886, 27, 515.

Emulsion of Chian Turpentine—Preparation.—Mr. Henry Campbell gives the following formula for an emulsion of chian turpentine—the form which he regards most suitable for the internal exhibition of the remedy:

Place in a large mortar 240 grains of pulv. acacia and 50 grains of pulv. tragacanth; add as much ethereal tincture of chian turpentine (which see under "Tinctura") as contains 240 grains of the drug; mix, and add all at once a fluidounce of water; triturate until an emulsion is formed, then dilute gradually to eight fluidounces, observing that all traces of ether are removed by exposure with frequent stirring in an open vessel, and preferably in the cold. Two fluidrachms of the emulsion contain seven and a half grains of the pure drug, the usual initial dose. —Pharm. Jour. and Trans., Dec. 4, 1886, 445.

Emulsions of Chloroform and Ether—Preparation with Gum Arabic. Mr. T. S. Wiegand, after trying different methods for emulsionizing chloroform, found the following to answer admirably, viz: That of putting the powdered gum in a dry bottle, pouring on the chloroform, shaking them thoroughly, and then adding the water with constant shaking. While this completely mixes the chloroform it does not remain as a full, well-mixed emulsion, but separates into two layers, a white thick one which contains the gum and chloroform and a clear thin one mostly of water only. When making a mixture containing ether the result was quite different, the gum being put, as before, in a dry bottle, the ether added and lastly the water—an emulsion was effected very quickly and it was nearly transparent; upon standing a separation took place, the gum and ether rose to the surface as a transparent layer and under it the water; these were very easily mixed by simply shaking, and a complete suspension of the ether was effected. The advantages of this process are two-fold, the rapidity by which it can be effected, and the certainty of the mixture being always uniform.—Amer. Jour. Pharm., May 1887, 233.

PILULÆ.

Pill Masses—Powdered Yellow Wax an Excipient.—It is stated in Pharm. Centralh. (xxviii, 75), that powdered yellow wax is a good excipient for pill masses containing balsams or ethereal oils. Wax is readily powdered by triturating with an equal quantity of granulated sugar, adding several drops of alcohol. Two parts of this mixture and a small quantity of starch, etc., yield with one part of oil or balsam a good, non-voluminous mass.

Gelatin-Coated Pills—Advantage Over Other Coated Pills. — Mr. Thomas Thompson records some experiments made to determine the relative solubility of coated pills, the samples examined comprising gelatin-, pearl-, sugar-, and tolu-coated pills. He finds the gelatin coating to be most rapidly dissolved, and consequently to be preferred to all others. He, however, cautions against the use of factory-made pills, since it appears to be the practice to make the pills very hard before coating, rendering the pills themselves slowly soluble, however soluble the coating may be. Respecting

Keratin-Coated Pills, the author states that he has examined some that he purchased, and found evidence of the contents having been dissolved after eighteen minutes' immersion in an aqueous menstruum at 95° F. He does not claim that the keratin coating was dissolved, but that possibly, as in the case of tolu-coated pills, the keratin coating was ruptured. It follows, then, that the pills would be liable to the same action in the stomach, and that keratin coating does not absolutely protect the contents of the pill before reaching the intestine.—Pharm. Jour. and Trans., April 23, 1887, 863–864.

Keratin-Coated Pills — Insufficiency of the Process.—Mr. E. Mylius observes that numerous experiments have shown that a keratin coating does not avail in the case of pills containing ingredients that are soluble in water. If such pills are to pass into the small intestine intact, the mass must be made with a fatty substance melting a little over 40°, or the pills must be enclosed thickly with such a fat. The coating with keratin may then be omitted.—Arch. d. Pharm., Dec. 1886, 1025; from Pharm. Centralh., 1886, 27, 515 *et seq.*

Collodion-Coated Pills—A Substitute for Keratin Coating.—Mr. Bernbeck proposes collodion as a coating for pills, as a convenient and satisfactory substitute for keratin. The collodion covering, similar to that of keratin, is not dissolved until the pill enters the lower bowel, and therefore of service in administering remedies designed to act only beyond the pyloric ring. As excipients for the mass, powdered althea and mucilage of acacia are recommended, and the pills should be thoroughly dried before the coating is applied.—West. Drugg., June 1887, 188.

Pills in Concentric Layers—Preparation and Advantages.—Mr. J. Mortimer Granville suggests a method of compounding pills, which he thinks possesses important advantages. If one desires, for example, to administer one drug which shall be dissolved in the stomach with one which shall be dissolved in the intestine, the core of the pill, which is to be last acted upon, is first made and coated with keratin, which is not acted upon by the acid gastric juice, but dissolves readily in the alkaline fluids of the intestine. The pillule is covered then with the desired quantity of the drug which is to act on the stomach, and is again coated with gelatin or sugar, like ordinary pills.—Brit. Med. Jour., Oct. 9, 1886.

Quinine Pills—Hydrochloric Acid as Excipient.—Mr. Waage recommends hydrochloric acid as excipient for making pills from hydrochlorate of quinine, using 6 drops for 5 grams of the salt. If too much acid is used the mass becomes sticky, and it must consequently be added with care, a slightly larger or smaller quantity than that above indicated being necessary according to the variation in the size of the drops. If the proper proportion has been used, a very manageable mass is obtained; the pills soon harden, do not become soft in moist air, and retain their ready solubility indefinitely.—Arch. d. Pharm., Feb. 1887, 132; from Pharm. Zeitschr. f. Russl., 1886, 25, 813.

Pills of Ferrous Chloride—Formula Insuring Permanence.—Mr. Simon proposes the following formula for securing permanent pills of ferrous chloride: 5 g. ferrous chloride, 1 g. powdered sugar, 1 g. powdered althea, and 0.2 g. powdered tragacanth, are made into a mass with simple syrup; the mass is rolled into 50 pills, which are coated first with powdered iron, then moistened with an ethereal tincture of tolu, rolled in sugar, dried, the excess of sugar sifted off, and then again coated with ethereal tincture of tolu. The latter is best prepared from balsam that has been extracted with water in the preparation of syrup, using 1 p. to

2 g. of ether.—Arch. d. Pharm., March, 1887, 272; from Jour. de Pharm. et de Chim., 1886, xiv. 556.

Blaud's Pills—Proper Formula.—Mr. W. Duncan, in the course of his experiments to determine the best formula for making Blaud's pills, examined nine samples of these pills obtained from different sources, and found them to vary very considerably in the amount of ferrous carbonate they contained. The theoretical quantity of $FeCO_3$ should be 20.8 per cent. if 50 per cent. of crystallized ferrous sulphate is used. Only three of these samples contained this amount approximately, one of them a slight excess, the other two a slight deficiency; of the remaining six, four contained from 14.25 to 15.4 per cent., the two others 9.9 and 10.0 $FeCo_3$ respectively. The author prepared pills by several of the most approved formulas, but found the following formula of Martindale to yield the most satisfactory pills:

℞.	Ferri sulph	2½ grs.
	Potass. carb.	1½ grs.
	Sacchar.	1 gr.
	Pulv. trag.	⅙ gr.

These pills, after keeping them in an ordinary chip box for two months, the boxes being opened from time to time, were only very slightly marked with damp-looking patches, the pill powder (pulv. amyli with 5 per cent. tragacanth), being slightly caked on them. In all other respects the pills were perfectly sound. The addition of glycerin, as suggested by Mr. Ince, seems to have the effect of softening the pills after a time. The author thinks that if the pills as obtained by Martindale's formula are varnished with a solution of tolu in ether, they will keep well, though he has not had time to subject them to this test.—Pharm. Jour. and Trans., March 19, 1887, 775.

Referring to Mr. Duncan's paper, Mr. Peter Boa gives the following formula: Rub granulated (precipitated) ferrous sulphate, 30 grains, with sugar 10 grains, add potassium carbonate (15 to 16 p. c. H_2O) 20 gr., triturate, add powdered tragacanth, 3 gr., and beat into a mass for twelve pills. The beating required is considerable, but nothing else is needed to make a mass which rolls easily if not allowed to lie. These pills keep for any reasonable time with only a trifling loss of ferrous salt; it is unnecessary to coat them.

Mr. Thos. Thompson suggests the use of gelatin capsules, the two exsiccated salts to be incorporated separately, with almond oil, then mixed and put into capsules. Or 24 pills may be made according to the following formula:

Exsiccated sulphate of iron	36 grains.
Anhydrous carbonate of potassium	30 "
Powdered sugar of milk	25 "
Pulverized tragacanth	10 "
Castor oil sufficient.	

The mass is not easily rolled out; but after the pills have been made two days they may be coated with gelatin, and will then keep without any decomposition taking place.—Pharm. Jour. and Trans., April 23, 864–866.

Iron-Magnesia Pills—Process of Preparation.—Mr. F. Musset communicates the following formula for preparing "iron-magnesia pills:" 500 g. sulphate of iron (coarsely powdered crystals), 50 g. sugar, 50 g. glycerin, and 250 g. water, are heated on a steam-bath in an iron or porcelain mortar, the tare of which, together with the pestle, is known. The heat is continued until about one-half of the ferrous sulphate is dissolved, when 185 g. carbonate of magnesium is added in portions of a spoonful at a time, the reaction being facilitated by trituration. The contents of the mortar are then evaporated to 885 g., allowed to cool while stirring, and then rapidly and well mixed with 20 g. powdered tragacanth. It is then allowed to stand for two hours, during which time the tragacanth has swelled sufficiently, and a good plastic mass results, which is easily rolled into pills of the desired size. The mass is light grey, but becomes superficially oxidized to a green color. The mass becomes somewhat hard on standing for some time, but again acquires its plasticity by kneading.—Arch. d. Pharm., July 1886, 597; from Phar. Centralh., 1886.

PULVERES.

Ferrum Oxydatum Saccharatum Solubile—Volumetric Determination of Iron.—Dr. William Strohmeyer, Jr., recommends the following simple method for the determination of the iron in the saccharated oxide of iron, which is more expeditious than the method prescribed by the Pharm. Germ. One gram of the preparation is dissolved by the aid of heat in 50 ccm. of water, 2 grams of sodium chloride added, and the mixture boiled 5–6 minutes. The precipitated ferric oxide is collected on a filter, allowed to drain, and dissolved while on the filter in warm hydrochloric acid. The solution of ferric chloride is collected in a glass stoppered flask, the filter carefully washed, and 1 gram of iodide of potassium added to the filtrate. After standing one hour the quantity of iodine separated is determined volumetrically with $\frac{1}{10}$ normal hyposulphite of sodium, and the iron calculated from the data so obtained. In a similar manner the amount of iron in

Ferrum Carbonicum Saccharatum is determined. The iron is precipitated completely by boiling 1 gram with 50 cc. of water and 10 cc. of ammonia water containing 10 per cent. NH_3 for 5 minutes, then boiling for 5 minutes with 5 grams of sodium chloride. The precipitate is dissolved, as above, in hydrochloric acid, the ferrous chloride converted into ferric chloride by treatment with a little chlorate of potassium, and the solution then further treated as above.—Arch. d. Pharm., 1886, 542–546.

Ferrum Carbonicum Saccharatum and *Ferrum Oxydatum Sacch. Solubile—Determination of Iron.*—Mr. E. Mylius regards the process of the Pharm. Germ. for the determination of the iron to be unnecessarily circumstantial. He finds that in the case of ferrum carbon. sacchar. there is no difficulty to obtain complete combustion by the ordinary method, so that the residue may be calculated as ferric oxide. In the case of ferrum oxydat. sacch. solubile, accurate results are obtained if 2 grams of the preparation are incinerated in a wide porcelain or platinum crucible, after first moistening with 8 drops of officinal (Ph. Germ.) nitric acid. To avoid frothing over, the crucible is heated first on one side, then on the other, until complete carbonization has taken place. The charred mass is then broken up with a glass rod, spread out over the surface of the crucible, and the combustion completed with crucible partly covered. To insure against the presence of ferrous oxide, the residue is moistened with nitric acid, and again heated to redness. The only inaccuracy of this process is due to the possible presence of traces of alkali salts. The quantity of these is readily ascertained by extracting the residual ferric oxide, after weighing, with boiling distilled water, again drying the residue, heating to redness and weighing.—Arch. d. Pharm., Aug. 1886, 669; from Pharm. Centralh., 27, 290.

Cinchona Sugar (Saccharolé de Quinquina)—Preparation.—Mr. F. Vigier, in view of the fact that in most of the preparations of cinchona, such as wine, syrup, extract, decoction, etc., in use in France, only a small proportion of the alkaloids is retained, proposes the following process for making a preparation which contains not alone all of the alkaloids of the bark, but also all other tonic constituents. He introduces the preparation under the designation of "saccharolé de quinquina." One part of coarsely-powdered cinchona is macerated for twelve hours with four times its weight of $\frac{1}{10}$ normal hydrochloric acid. One-tenth part of glycerin is then added, and the contents of the percolator are displaced with water until the liquid passing no longer becomes turbid on the addition of soda solution. The percolate is concentrated to the consistence of a thin extract, and sufficient sugar is added to make the total weight of the product weigh one part. If towards the end of the evaporation about 3 per cent. of citric acid is added, the alkaloids retain their soluble condition, though the preparation has a more bitter taste.—Arch. d. Pharm., Nov. 1886, 940; from Jour. de Pharm. et de Chim., 1886, xiv, 247.

Hydrargyrum cum Creta—Examination.—A sample of this preparation made according to the pharmacopœial formula of 1870, and over two and a half years old, was examined by Mr. Wm. S. Young. It lost over sulphuric acid 0.25 per cent. of moisture; water dissolved 0.75 per cent., containing a trace of mercuric salt; dilute acetic acid dissolved 63 per cent., including mercurous and a trace of mercuric oxide; dilute hydrochloric acid now removed merely a trace of mercuric oxide; the residuary metallic mercury weighed 34.5 per cent.

Two samples made according to the present formula and respectively six and two months old, were examined in the same manner, and gave

Moisture, 0.16; aqueous solution, 14.4; acetic acid solution, 50.5; mercury, 33 per cent.
" 0.12 " " 11.76 " " 49.3 " 38 "

Hydrochloric acid dissolved nothing. In the acetic acid solution mercurous salt was found, mere traces of it in the last one, and a somewhat larger quantity in the older sample.—Amer. Jour. Pharm., Dec. 1886, 591–592.

Pulv. Glycyrrhizæ Comp., B. P.—Griping Effect.—Dr. M. Oxley, having found the compound licorice powder of the Brit. Phar., which is identical with that used in Germany, and differs but slightly from that of the U. S. P., to produce griping, proposes a modified formula in which anise is substituted for the fennel, and one-fourth part of ginger replaces an equal weight of sugar, viz.:

Senna	2 parts.
Liquorice root	2 parts.
Anise	1 part.
Sulphur	1 part.
Ginger	¼ part.
Sugar	5¾ parts.

—The Lancet, Oct. 2, 1886.

Antiseptic Powder—Formula, etc.—Mr. Lucas Championière recommends an intimate mixture of equal parts of finely powdered and sifted iodoform, quinine, benzoin, and carbonate of magnesium saturated with oil of eucalyptus. This powder may be applied directly to a wound or over a protective covering, and should be covered with cotton wool, and over this again macintosh should be kept in position by a bandage. After large operations the dressing should be renewed every third day; after small ones it may remain on eight days.—L'Union Médicale, December 11, 1886.

RESINÆ.

Jalapin and Jalap Resin—Commercial Quality.—Mr. Edmund White has examined eight specimens of jalapin and six of jalap resin, and obtained results which with four exceptions show that they were derived from true jalap, but they nevertheless proved not to be true jalapin, being mainly composed of convolvulin—the in ether insoluble constituent of jalap. Of the resins only two answered the tests required of true jalap resins. A third one had evidently been unskillfully prepared, while the remaining three were extremely unsatisfactory substances.—Pharm. Jour. and Trans., Feb. 12, 1887, 650–652.

Resinoids or Concentrations—History, Preparation and Characters.—Prof. J. U. Lloyd contributes a paper on the "resinoids" or, as he prefers to call them, "concentrations" of eclectic medicine, with a view to clearing up the confusion respecting their characters, and resulting in great part from the identity of their names with those of well-known and definite plant constituents (Alkaloids, Glycerides, etc.) The necessity for a thorough understanding of their character is all the greater, because some of these concentrations have passed from their originally exclusive use by eclectic practitioners into general use by medical practitioners throughout the civilized world. The first of these "concentrations" was podophyllin, prepared by Dr. John King in 1835, and reported on by him in 1844. In the course of years other "concentrations" or "resinoids" were added, mostly however from drugs at the time almost exclusively used by eclectics. Originally prepared by the precipitation of alcoholic extracts in water, this method was found inadequate in the case of some of the drugs, and chemical agents were resorted to, particularly alum, the alcoholic solution of the drug having been first rendered alkaline by ammonia to facilitate the decomposition of this double salt. Acids and alkalies were also employed in some cases by themselves, dissolved in the water used as precipitant; but the method of preparation was in all cases a purely empirical one and is so to this day, each manufacturer using a process that is in his opinion best adapted to the purpose, and hence the variability in character of "concentrations" of the same name as supplied by different manufacturers. In view of the increased use of these "concentrations" by practitioners of medicine of all schools, Prof. Lloyd's paper deserves particular attention, since it at least throws the first glimpses of light upon a subject which has hitherto been very carefully secluded in the dark. The author divides the "concentrations" into four groups:

Group A.—Resinoids which are completely soluble, or nearly so, in alcohol: Podophyllin, cimicifugin (macrotin), aletridin, iridin, eryngin, asclepidin, helonin, liatrin, ptelein. With the exception of the first two, these resinoids were formerly supplied only in their soft condition as oleoresins. They are now obtainable also in powdery form prepared as under Group C., under which they are again mentioned, aletridin and iridin being distinguished in the latter form by the names aletrin and irisin.

Group B.—Resinoids which in general contain inorganic admixtures and with few exceptions have a green color: Barosmin, euonymin (green), lobelin, lycopin, senecin, scutellarin, podophyllin (yellow).

Group C.—Resinoids which in general contain powdered vegetable matter in admixtures: Aletrin, alnuin, ampelopsin, apocynin, asclepidin, baptisin, betulin, caulophyllin, cerasin, chelonin, chimaphyllin, chionanthin, collinsonin, colocynthin, cornin, corydalin, cypripedin, dioscorin, euonymin (brown), eupatorin, euphorbin, eupurpurin, eryngin, fraserin, gelsemin, geranin, gossypin, hamamelin, helonin, humulin, hydrastin, inulin, irisin, jalapin, juglandin, leontodin, leptandrin, liatrin, liriodendrin, menispermin, myricin, phytolaccin, prunin, ptelein, rhein, rhusin, rumicin, smilacin, stillingin, taraxin, trillin, viburnin, xanthoxylin.

Group D.—Resinoids which are alkaloids or alkaloid salts in a more or less pure condition: Hydrastin (containing a preponderance of berberine salts), hydrastin citrate, chloride, nitrate, phosphate and sulphate, sanguinarin (impure alkaloid), sanguinarin nitrate and sulphate.

The resinoids most in demand are: Podophyllin (U. S P.), podophyllin (yellow), euonymin (green and brown), irisin, and hydrastin (alkaloid).—Pharm. Rundschau, May 1887, 105–107.

SAPONES.

Castile Soap—Examination of Commercial Samples.—Four samples of white Castile soap, examined by Mr. H. C. Risher, were free from animal fats and salts of metals. Determinations of moisture and insoluble matters gave the following results:

1. Spanish	11.36	per cent.,	moisture.	7.73	per cent.,	insoluble	in alcohol.
2. Yanuti	14.94	"	"	1.72	"	"	"
3. Conti	10.99	"	"	3.55	"	"	"
4. Italian	10.66	"	"	2.89	"	"	"

The insoluble matter was almost completely soluble in distilled water. —Amer. Jour. Pharm., Feb. 1887, 69–70.

Sapo Mollis, B. P.—*Characters of the Commercial Article.*—In the course of his discussion on *Linimentum terebinthinæ* (which see), Prof. Redwood mentions that he has examined numerous commercial samples of "Sapo mollis," and with a single exception found them all to have a marked green color. This color is in conformity with the B. P., which describes it as "yellowish green," but he has never made or seen produced a soap of this color when the direction of the Pharmacopœia is followed. All the soaps were free from caustic alkali, but they all contained a little carbonate (1.4 to 2.8 per cent.). It is desirable that this be absent, and to accomplish this, solution in alcohol and evaporation of the filtrate may be resorted to.—Pharm. Jour. and Trans., March 12, 1887, 741–742.

Soft Soap—Presence of Free Caustic Alkali.—Mr. Harry Napier Draper, referring to Prof. Redwood's observation that the soft soaps of commerce do not contain any free caustic alkali (see above), remarks that an alcoholic solution of soft soap, during filtration, absorbs carbonic acid so rapidly, that in the presence of a small quantity of free caustic alkali, this is converted into bi-carbonate, and consequently gives no reaction with phenolphthalein. As a matter of fact an unfiltered alcoholic solution of pharmacopœial soft soap reddens phenolphthalein, whilst the same solution filtered does not.—Pharm. Jour. and Trans., April 23, 1887, 867.

Mollin—A New Ointment Base.—Mollin is a soft soap containing 17 per cent. of uncombined fat, and is stated to be prepared by saponifying without heat 100 parts of cocoanut oil or of fresh fat with 40 parts of solution of caustic potassa (spec. grav. 1.145, containing 15 per cent. KHO), mixing intimately with 30 parts of glycerin and heating carefully. If properly made, mollin is yellowish white and of a smooth and soft consistence, not readily altered by exposure, free from rancidity and from irritating properties, and easily removed from the skin by warm or cold water. It is highly recommended by Dr. T. A. Kirsten as a vehicle for the application of mercury and its compounds, balsam of Peru, storax, phenol, thymol, naphthol, naphthalin, chrysarobin, iodoform, salicylic acid, and other substances used for inunction.—Monatsh. f. pr. Dermat., Aug. 1886; Amer. Jour. Pharm., Dec. 1886, 597.

Mollin—Preparation and Comparative Composition —Mr. Theo. Canz prepares mollin, or super-fatted soap, by employing a proportion of fat to alkali to the amount of 17 per cent. in excess of the base. The particulars of the method are not given, but Mr. Th. Alfred Kirsten, who draws attention to this preparation as a new vehicle for the cutaneous exhibition of dermatological remedies, gives its composition as compared to other soaps as follows:

Mollin contains for 100 parts of fat, 40 parts of lye and 30 parts of glycerin.

Sapo Kalinus Albus contains for 100 parts of fat, 56 parts of lye.

Sapo Mollis, Hebra, contains for 100 parts of fat, 60 parts of lye, and 20 parts of alcohol.

Sapo Viridis contains for 100 parts of fat, 75 parts of lye and 60 parts of water.—Arch. d. Pharm., June 1887, 545–546; from Monatsh. f. prakt. Dermat.

Super-fatted Soap—Preparation.—Mr. E. Dieterich (Helfenberger Annalen, 1886) prepares super-fatted soap (Sapo unguinosus, Sapo leniens, Mollin) as follows: 100 p. of pure carbonate of potassium are converted into caustic potash with 60–80 p. of burnt lime and sufficient water, the solution being concentrated to a sp. gr. 1.180; 400 p. of lard are added, the mixture is stirred for half an hour, 40 p. of alcohol are added, and the whole is digested for 12 hours in a covered vessel at 50–60°. The soap is finished by the addition of 150 p. of glycerin. The saponaceous ointment so obtained may be medicated by the addition of metallic mercury, balsam of Peru, camphor, chloroform, ichthyol, iodoform, alkaline sulphides, kreasote, sulphur, styrax, tar, thymol, or oxide of zinc. On the other hand, it is not suited for iodide of potassium, mercuric oxide, lead oxide, or white precipitate.—Arch. d. Pharm., June 1887, 496.

Sublimate Soap—Determination of Mercury.—Mr. O. Kaspar recommends the following method for determining the mercury, present as soluble salt, in corrosive sublimate soap: 10.0 grams of the sample, in fine shavings, are boiled for ten minutes in a capacious flask with 10.0 grams of diluted hydrochloric acid and 100.0 grams of water; the contents of the flask are allowed to cool completely, the liquid is decanted from the congealed fat-cake, which is then treated twice successively in the same manner. The united liquids are evaporated to about 100.0 grams, treated with sulphide of ammonia, the sulphide of mercury collected on a filter, and dried to constant weight at 100° C. 232 p. HgS correspond to 271 p. $HgCl_2$. The absence of other metals, precipitable by sulphide of ammonium, is determined in an aliquot part of the acid solution by well known methods.—Arch. d. Pharm., Nov. 1886, 934; from Schweiz. Wochenschr. f. Pharm., No. 35, 1886.

SPIRITUS.

Compound Spirit of Ether, B. P.—Criticism of Process.—Mr. D. B. Dott observes that among the preparations introduced into the recent B. P., *spiritus ætheris compositus* must probably be classed among the few medicaments whose claims to be recognized can scarcely be considered strong. He concludes from his experiments, which are given in some detail, that the pharmacopœial directions for its preparation admit of a very variable result; that the process produces principally ether, which is wasted; that there is no evidence that the oil of wine produced is of such potency as to warrant the great waste incurred in its preparation; and that the introduction of this preparation appears to be a step backward.—Yearbook of Pharm., 1886, 564–565.

Spirit of Nitrous Ether—Preparation and Utilization of Residue for the Production of Oxalic Acid.—Mr. H. Frickhinger makes some critical remarks on the preparation of spirit of nitrous ether according to the directions of the Pharm. Germ. He prefers the use of a stronger alcohol than is prescribed: instead of alcohol sp. gr. 0.832, alcohol of sp. gr. 0.812. The product of the direct action of nitric acid upon the alcohol thus becomes less contaminated with acid, whilst the nitric acid is completely consumed. The residue in the retort contains very considerable quantities of oxalic acid, which, the author thinks, might be profitably utilized. The author makes some practical remarks and observations respecting the working details of the generation of the ether and rectification of the spirit, for which reference may be had to Arch. d. Pharm., Dec. 1886, 1065–1068.

Spirit of Nitrous Ether.—Construction and use of a simple *Nitrometer*, which see under "Apparatus," page 19.

Arom. Spir. Ammonia, B. P. 1885—Method of Examination.—Mr.

A. C. Abraham records a number of experiments made to determine the quality of arom. spir. ammonia of commerce. He regards the present process of the B. P. to be an excellent one, but was disappointed in the character of the commercial product, which did not conform to the requirements. He has tried several methods for the determination of the amount of carbonate of ammonia present in the sample, but finds the following to be superior, both on account of its accuracy and the celerity with which it can be executed. He proceeds as follows: To 150 fluid grains of volumetric solution of oxalic acid (half strength) contained in a beaker, add 1 fluidrachm of the sample, shake and boil two minutes, and titrate back with volumetric solution of soda. The number of fluid grains of the latter employed, multiplied by two, and deducted from 150, gives the quantity of total ammonia present in terms of half strength volumetric solution of oxalic acid.—Pharm. Jour. and Trans., Dec. 25, 1886, 512–514.

Spir. Ammon. Arom.—Estimation of Carbonate of Ammonia.—Mr. Edward D. Gravill finds Allen's nitrometer (see Proceedings 1885, 268–269) to serve a good purpose for the estimation of carbonate of ammonia in spir. ammon. arom., the process being applied as follows: The author replaces the saturated solution of common salt by mercury, and having adjusted the mercury in the two arms of the apparatus, 5 cc. of the sample are carefully introduced through the stop-cock on to the surface of the mercury, as in the case of sweet spirit of nitre; 10 cc. of a solution of hydrochloric acid, one in two, are next measured into the cup of the apparatus ready for introduction, 5 cc. only of which are allowed to enter the tube, and this in small quantities at a time. Brisk effervescence ensues, which is encouraged by agitation of the tube, with the consequent liberation of the carbonic acid present, which displaces the mercury, and collects on the surface of the liquid in the graduated tube. The volume of the liquids introduced measuring 10 cc., 10 cc. of the same liquids, in the same proportions, are placed on the mercury in the opposite arm of the apparatus; this properly adjusts the equilibrium of the liquid, and so regulates the pressure, the level of the liquids being adjusted by raising or lowering the tubes. The volume of liberated gas after standing for five minutes may be read off, and the calculation of carbonate made accordingly, temperature and pressure being at the same time noted. The author gives examples.—Pharm. Jour. and Trans., Dec. 4, 1886, 445–446.

Spiritus Sinapis—Deterioration by Age.—Mr. E. Mylius has found that in spirit of mustard which had been kept for some time, a portion of the volatile oil had become converted into semi-sulphurated allylurethane, which has been supposed to form only by the aid of heat. It follows, therefore, that this spirit should be made only in quantities likely to be consumed in a short time.—Arch. d. Pharm., March 1887, 218; from Pharm. Centralh., 1887, 28, 32.

SUCCI.

Succi, B. P.—*Examination of Commercial Samples.*—Mr. Arthur Smith, in view of the fact that very little information respecting the quality and strength of the vegetable juices officinal in the B. P. is obtainable in text-books or journals, has made experiments to secure the desired information. Omitting the details of the author's interesting experiments, the following tables give the results:

SUCCUS BELLADONNÆ.

No. of Sample.	Specific Gravity.	Amount in Grams of Alkaloid in 100 cc.	Volume of Spir. Vin. Rect. in 100 cc.	Dry Residue Grams in 100 cc.
1	.9950	trace.	23.860	2.360
2	.9865	.05	24.157	2.665
3	.9915	.0325	24.585	3.285

SUCCUS CONII.

No. of Sample.	Specific Gravity.	Amount in Grams of Alkaloid in 100 cc. as chloride.	Volume of Spir. Vin. Rect. in 100 cc.	Residue from 100 cc.
1	.9878	.284	28.789	3.440
2	.9915	.100	25.122	3.580
3	.9935	.088	23.633	4.600

SUCCUS HYOSCYAMI.

No. of Sample.	Specific Gravity.	Amount in grams of alkaloid in 100 cc.	Volume of Spir. Vin. Rect. in 100 cc.	Residue from 100 cc.
1	.9811	.0166	28.404	4.66
2	.9892	.0233	23.533	2.69
3	.9844	.02166	27.469	3.52

SUCCUS SCOPARII.

No. of Sample.	Specific Gravity.	Amount in grams of alkaloid in 100 cc.	Volume of Spir. Vin. Rect. in 100 cc.	Residue from 100 cc.
1	.9833	.0375	28.327	2.13
2	.9859	.0750	26.321	2.19
3	.9932	.1530	25.220	4.56

SUCCUS TARAXACI.

No. of Sample.	Specific Gravity.	Relative Bitterness.	Volume of Spir. Vin. Rect. in 100 cc.	Residue from 100 cc.
1	.9847	78	27.814	3.61
2	.9889	91	28.855	5.86
3	1.0136	100	24.903	10.01

SUCCUS DIGITALIS.

No. of Sample.	Specific Gravity.	Amount in Grams of Glucoside in 100 cc.	Volume of Spir. Vin. Rect. in 100 cc.	Residue from 100 cc.
1	.9808	.100	28.686	2.50
2	.9906	.055	25.053	2.76
3	.9908	.075	26.663	4.00

—Pharm. Jour. and Trans., April 9, 1887, 835–837.

"Prune Juice"—Composition and Character of the Article Known in Commerce under this Name.—Mr. J. N. Hurty has examined an alcoholic liquid which, under the name of "prune juice," is known in the trade and used in compounding and rectifying by liquor men. Its color is light yellow; flavor and odor fruity; very sweet; sp. gr. 1.0559; alcohol, 18.24 p. c.; solid residue at 110° C., 15.42 p. c., consisting of glucose, sucrose, and glycerin. The distillate bore a very marked resemblance to the flavor and odor obtained by distilling pulped prunes with deodorized spirit and water. The author considers this article to be obtained by soaking prunes in a liquor composed of 80 parts of water and 20 parts of deodorized alcohol, holding in solution glycerin, sugar, and possibly some glucose.—West. Drugg., April 1887, 111.

Papaw Juice—Components.—According to the researches of S. H. C. Martin, papaw juice contains besides the digestive ferment, papaïn, which is associated with an albumose, also a milk-curdling ferment. The proteïds present in papaw juice were found to be as follows: 1. Globulin, resembling serum globulin in its most important properties. 2. Albumin. 3. β-Phytalbumose precipitated almost completely by heat, by saturation with neutral salts, but not by dialysis. It differs from the heteroalbumose of Kühne and Chittenden, by not being precipitated by dialysis, by copper sulphate, or by mercuric chloride. 4. α-Phytalbumose, soluble in cold or boiling water; not precipitated by saturation with neutral salts, except in an acid solution. This is the vegetable peptone referred to by Vines (*J. Physiol.*, iii) as hemialbumose. It differs from the protalbumose of Kühne and Chittenden by its non-precipitation by sodium chloride or by copper sulphate. Both these albumoses give the biuret reaction. No peptones occur in the juice, but leucine and tyrosine are present.—Jour. Chem. Soc., July 1886, 642; from Jour. Physiol., vi, 336–360.

SUPPOSITORIA.

Gelatin Bougies, Suppositories, etc.—Directions for Preparation, etc.—The best gelatin for pharmaceutical uses is the French silver gelatin No. 1. The proportions of gelatin, glycerin and water cannot be the same for all preparations, because the action of the medicament on the mass, deliquescence or coagulation, must be taken into consideration.

Where gelatin preparations are frequently dispensed it is best to have a definite mass in stock. This is made in large quantities. After removing the scum from the solution it is poured into suitable bottles and when thoroughly cooled covered with alcohol to prevent it from becoming mouldy. When wanted for use the bottle is placed in a water-bath, and the required quantity is poured off. The mass is made as follows: The accurately weighed gelatin is allowed to macerate over night in distilled water and strained through a sieve. The gelatin adhering to the sieve is collected, the whole placed in a tared porcelain capsule, and sufficient water added to make the weight four or five times as much as the original quantity of gelatin used. The capsule is placed on the upper ring of a retort-stand and heated over wire-gauze with a gas or spirit-lamp flame, care being taken not to burn the gelatin. The glycerin is added and the whole evaporated to the consistency mentioned in the following table:

	I. Evaporated to 60 parts.	II. Evaporated to 25 parts.	III. Evaporated to 50 parts.	IV. Evaporated to 60 parts.	V. Evaporated to 104 parts.
Gelatin	20	10	10	10	30
Water.	80	40	40	40	120
Glycerin	40	15	20	30	15

The anhydrous mass No. 1 is intended for preparations kept in stock, and for those which are to retain their transparency; mass No. 2, for hygroscopic drugs; No. 3, for suppositories; No. 4, for vaginal balls, ear-almonds, and bougies; No. 5, for crayons or bougies, containing a large percentage of iodoform.

Bougies. Bougies containing sulphate of zinc, sulphate of copper, nitrate of silver, extract of opium, hydrochlorate of morphine, bichloride of mercury, etc., are made as follows: one part of sulphate of zinc, or any of the above-mentioned medicaments, is first dissolved in a little water, and then added to 99 parts of mass No. IV, and poured into moulds. If it is desired to make a large quantity of sulphate of copper bougies it is best to mix not more than the mould will hold at a time, because by frequently heating the mass the bougies acquire a yellowish-green color instead of a blue green.

Bougies of carbolic acid (5 per cent.), and similar medicaments soluble in a small quantity of alcohol are made by adding 3 parts of carbolic acid previously dissolved in alcohol to 7 parts of glycerin and 50 parts of mass No. III.

Bougies of iodoform (50 per cent.), and of similar medicaments insoluble in water and alcohol, by adding 27 parts of powdered iodoform to 54 parts of mass No. V. When taken from the mould the bougies are placed in a drying closet until they weigh about two-thirds of their original weight.

Bougies of ferric chloride (5 per cent.), and of similar hygroscopic drugs by dissolving 1 part of sesquichloride of iron in 9 parts of water, and adding to 19 parts of mass No. II.

Alum bougies (2 per cent.). 25 parts of mass No. III, and 10 parts of distilled water are liquefied in a water bath. To this is added a *hot* solution of 7 parts of alum, 10 glycerin, and 5 distilled water. The whole is then evaporated with slight agitation to 35 parts. The mixture becomes thick and turbid on adding the solution of alum, but on heating over a water bath and stirring carefully, the mixture soon becomes clear and transparent. *Hot water* must be added from time to time to replace that lost by evaporation.

Bougies containing tannin .2 per cent. 0.66 of tannin is dissolved in 8 glycerin, and the hot solution added to 39 mass No. II, the whole evaporated to 33. The mass will coagulate on the addition of the tannin solution, but becomes clear when slowly stirred for 5 or 10 minutes on a water-bath. By this process 2 grams of tannin may be incorporated with 5 grams of gelatin. This formula is a very good one, and yields bougies which are very soluble. Schrieber states that he has met with tannin bougies which, on boiling with water for half an hour, did not dissolve.

Bougies of extract of krameria are not made with gelatin but with white glue. The requisite quantity of extract is dissolved in the 40 glycerin, and added to the hot solution of 15 glue in 20 water, stirring constantly until the mass is evenly distributed.

Bougies of salicylate and chloride of sodium are made by adding the finely triturated chemicals to 30 parts of gelatin mass No. II.

For *rectal suppositories* mass No. III is used, excepting for hygroscopic drugs which require where possible an anhydrous mass, either No. I or No. II.

For *vaginal balls* use about the same mass as is used for bougies. Suppositories or balls containing iodide or bromide of potassium, bromide, chloride or salicylate of sodium or ergotin, require mass No. II.

Suppositories of chloral hydrate are made with gelatin mass No. II, the chloral being added dissolved in a little water.—Phar. Rundsch. (Prag.), 1887, 101; Amer. Jour. Phar., June 1887, p. 299.

SYRUPI.

Syrups—Preparation.—Mr. Bert. L. Maltbie recommends the process of making syrups by percolation, and gives some details, which may be consulted in Pharm. Rec., March 15, 1887, 82.

Syrupus Rhei Aromaticus—Modified Formula.—Mr. Edward C. Lafean recommends the preparation of a tincture from the aromatics, making the product weigh half as much as at present directed for the aromatics and rhubarb. The latter, in No. 40 powder, is infused in a mixture of 2 parts of water and 1 part of glycerin at 180° F., the infusion strained, the dregs washed with water, and the requisite amount of sugar dissolved in the liquid to make a syrup, which is filtered hot. When cool, the aromatic tincture is added. The resulting syrup is transparent and keeps well.—Amer. Jour. Pharm., July 1886, 332.

Aromatic Syrup of Rhubarb.—Mr. R. Rother advises the preparation of this syrup as follows: Dissolve 15 minims of oil of cloves and 4 minims of oil of Ceylon cinnamon in a mixture of ¾ fluidounce each of fluid extract of rhubarb and of tincture of ginger; then add ½ drachm of carbonate of potassium and sufficient syrup to make 2 pints of finished syrup.—Drugg. Circ., Aug. 1887, 171.

Rock-Candy Syrup—Presence of Glucose.—In answer to a query, Mr. Chas. F. Hall reports to the Ohio Pharmaceutical Association the results of his examination of the so-called "rock-candy" syrup of commerce, with a view to determine whether it contains glucose. He concludes that it is fair to presume from his results that a large proportion of the "rock-candy" syrup put upon the market does contain glucose, but whether this is added with fraudulent intent or not, must be determined by further investigation.—Nat. Drugg., Oct. 29, 1887, 215–216.

Syrupus Althææ—Stable Preparation.—Mr. H. Noffke recommends the following method for preparing syrupus althææ that will keep well during hot weather. 10 p. cut marshmallow root are washed with distilled water, then macerated for 3 hours in a mixture of 5 p. alcohol and 250 p. distilled water, strained without pressure, and the strained liquid made up to 400 p. with distilled water; 300 p. sugar are dissolved in this liquid by the aid of heat, a little paper pulp is added, the syrup is boiled a short time, strained, filtered while hot, and rapidly evaporated to 500 parts, and at once filled in clean and *dry* vials of suitable size. The syrup so obtained is perfectly clean and has a light yellow color.—Arch. d. Pharm., Sept. 1886, 761; from Pharm. Ztg., 31, 419.

Syrupus Aurantii Corticis—Improved Process of Preparation.—Mr. Simon recommends the following process for preparing syrup of orange peel, which is rich in aroma, bitter and astringent substances, and will not ferment: 100 grams of coarsely powdered bitter orange peels are macerated for 24 hours with 200 grams of alcohol in a displacement apparatus, the alcohol is displaced by distilled water, and the percolation with water continued until 1230 grams of percolate are obtained, in which 1800 grams of sugar are dissolved at the temperature of the water-bath, and the syrup is filtered.—Arch. d. Pharm., March 1887, 272; from Jour. de Pharm. et de Chim., 1886, xiv, 545.

Syrup of Orange Peel—New Formula.—Mr. R. Rother recommends the following formula for preparing this syrup by simple admixture of a specially prepared tincture of orange peel (which see under "Tinctura") and syrup:

Tincture of orange	1 fluidounce.
Syrup	sufficient to make 2 pints.

Mix them.

The syrup yielded by this tincture is but faintly opalescent, and of a decided green-yellow tint.—Drugg. Circ., Aug. 1887, 171.

Syrup of Licorice—Preparation.—Mr. R. Rother prefers the licorice in mass, which is now easily obtainable in the market, for the preparation of syrup of licorice according to the following formula:

Licorice mass	2 troy ozs.
Borax	2 drams.
Sugar	24 troy ozs.

Water sufficient to make 2 pints.

Separate the licorice mass into small fragments, then add the borax and 20 fluidounces of water; and apply a gentle heat with constant stirring, until the fragments have all dissolved. If necessary, now add water to the measure of one pint, and set the mixture aside. When the supernatant liquid has become practically clear, decant it, mix it with sugar, and apply a moderate heat until a syrup is formed, and strain it through a fine sieve while warm.

The borax is preferable in the author's opinion to ammonia water for securing the retention in solution of the glycyrrhizin.—Drugg. Circ., Aug. 1886, 171.

Syrupus Ipecacuanhæ—Modification of Formula.—Mr. Fred Dunn has observed that the deposit of a slight amount of flocculent matter, occasioned when mixing the officinal fluid extract with syrup, is completely prevented by the addition of a few drops of ammonia water. He suggests the addition of 8 drops of the latter to a fluidounce of the fluid extract, mixed with a sufficient quantity of water, and to finish the syrup by percolation through the necessary quantity of sugar.—Amer. Jour. Pharm , July 1886, 331.

Syrupus Lactucarii—Modified Process.—Mr. Wm. A. M. Bath finds the process recommended by Mr. J. L. Lemberger (see Proceedings 1878, 762–764) to be preferable to the more tedious and complicated officinal one for preparing the fluid extract of lactucarium, and prefers to prepare the syrup at once from the lactucarium. The latter is exhausted with benzin or ether, as may be preferred, then treated with diluted alcohol, the tincture evaporated, and converted into syrup by the addition of sugar.—Amer. Jour. Pharm., July 1886, 332.

Syrup of Wild Cherry—Action of Nitrous Ether.—Mr. Thomas S. Wiegand has noticed the darkening of a mixture containing, among other ingredients, syrup of wild cherry and spirit of nitrous ether. He traces this darkening effect to the action of nitrous ether on the coloring matter of the wild cherry bark.—Amer. Jour. Phar., Jan. 1887, 18–19.

Syrupus Rhei—Modification of Officinal Formula.—Mr. Arthur Berrett suggests the preparation of this syrup from the fluid extract, and the substitution of oil of Ceylon cinnamon for cinnamon bark. The fluid extract, mixed with the oil, dissolves readily in water containing carbonate of potassium in solution, and the syrup is then finished in the usual manner.—Amer. Jour. Pharm., July 1886, 332.

Syrup of Rhubarb—Modification of Officinal Formula.—Mr. Otto George Miller recommends the preparation of syrup of rhubarb by dissolving 90 grains of carbonate of potassium in 12 fl. ozs. of cinnamon water, adding 28 ozs. of sugar, heating to the boiling point, and, when the sugar is dissolved, adding 4 fl. ozs. of fluid extract of rhubarb, strain and bring to the measure of two pints with cinnamon water. A pleasant, clear, efficient and permanent syrup results.—West. Drugg., April 1887, 107.

Syrup of Tolu—Practical Method of Preparation.—Mr. Edo Claassen communicates the following practical method for the preparation of syrup of tolu: The necessary quantity of hot water is poured into a well-tempered glass bottle, having a capacity exceeding by one-third the volume of the finished syrup; the sugar is added, and then the prescribed quantity of balsam of tolu. The flask and contents are heated in a water-bath at a boiling temperature for about 10 minutes, and when the balsam has melted, the contents are vigorously and frequently shaken, so that the balsam may become finely divided. Upon cooling, the syrup, holding in solution all the soluble constituents of the balsam, is simply decanted from the latter.—Pharm. Rundschau, 1887, 229.

Syrup of Tolu—New Process of Preparation.—Mr. Frederick Stephenson reviews the different published processes for the preparation of syrup of tolu, and finds them all faulty to a greater or less extent. It occurred to him that the balsam might be sufficiently exhausted by cold maceration, if the tolu was in a fine state of division, and the syrup completed without the application of heat; and the following is the result of a few experiments by way of putting this idea to the proof. He proceeded as follows:

Take of

Balsam of tolu	1¼ oz.
Finest loaf sugar	2 lbs.
Water	16 ozs.

Reduce the balsam to powder by trituration with 8 ozs. of the sugar. Place them in a bottle with the water, and macerate for forty-eight hours, with occasional agitation. Then filter through paper till bright, and dissolve the remainder of the sugar in the filtrate. This is best done by crushing (not powdering) the sugar, placing it in a percolator, and passing the filtrate through. The result is a clear and very full flavored syrup, which compares favorably with the product of any other published formula. It takes slow percolation to dissolve all the sugar unless the percolator is placed in a moderately warm place, but it might be worth considering whether so large a proportion of sugar is necessary. It is also a little difficult to completely clarify the syrup, and any suggestion in that direction would be an improvement.—Pharm. Jour. and Trans., March 26, 1887, 785.

Syrup of Tolu—Improved Process.—Referring to Mr. Stephenson's method of making syrup of tolu, Mr. W. H. Hostelley communicates the following process, originally suggested to him by Prof. Remington, which, he is sure, cannot fail to give satisfaction: For making twenty-five ounces of syrup, take one ounce of balsam of tolu, one pound of granulated sugar, and water which has been previously filtered through animal charcoal, enough to make twenty-five ounces (these are essentially the quantities directed by the U. S. P.); rub the tolu to a fine powder, aided by some of the sugar, and mix this with the remainder of the granulated sugar; now prepare a percolator by placing a piece of cotton in the neck, pack the powder in it, pour in the filtered water and receive twenty-five ounces of percolate.—Amer. Jour. Pharm., June 1887, 290.

Syrupus Tolutanus—Modification of Officinal Formula.—Mr. Silas J. Duffie proposes to digest 4 parts balsam of tolu in 30 parts of water at 80°C. for two hours, and to add, after cooling, 4 parts of alcohol; this mixture is strained through well wetted muslin, the residue on the strainer being washed with water to make 35 parts of strained liquor, in which 65 parts of sugar are dissolved by percolation.—Amer. Jour. Pharm., July 1886, 333.

Syrupus Sarsaparillæ Compositus—Simplification of the Officinal Formula.—Mr. A. Berrett recommends a modified process for the preparation of this syrup, in which the oils of sassafras, winter-green and anise, in proper quantities, are substituted for the drugs. The author's suggestions, which may possess some merit, will be found in Amer. Jour. Pharm., July 1886, 332–333.

Syrupus Scillæ Compositus—New Formula.—Mr. Geo. H. Ochse has employed the following formula, originated by Mr. C. A. Werckshagen, with uniform good success:

℞.—Aceti scillæ	Oj.
Antimonii et potassii tartrat	gr. xxiv.
Extracti senegæ fluidi	f. ℥ ij.
Syrupi simplicis	q. s. ad. f. ℥ xxiv.

Evaporate the vinegar of squill to the consistency of a soft extract to remove the acetic acid; then add 18 fluidounces of simple syrup, and apply heat; when clear add the tartar emetic and stir until dissolved;

then take off the fire and add sufficient syrup to make the whole measure 22 fluidounces; lastly, when cold add the fluid extract of senega. Mr. Ochse has never noticed any fermentation, and if the fluid extract of senega is exactly neutralized with ammonia, no gelatinization can occur.—Amer. Jour. Pharm., Dec. 1886, 591.

Syrup of Pulsatilla.—For a formula see *Anemone Pulsatilla*, under "Materia Medica."

Syrup of Yerba Santa—New Formula.—Mr. R. Rother prefers the following formula to the one before recommended by him (see Proc. 1886, 350):

Yerba santa leaves	2 troy ozs.
Sugar	24 "
Borax,	
Water, of each sufficient to make two pints.	

Contuse the yerba santa so as to form a coarse powder, and mix it with 2 drams of borax. Mix borax and water in the proportion of 2 drams of the former and one pint of the latter. Moisten the yerba santa with two fluidounces of this solution, and pack it firmly into a cylindrical glass percolator; then pour on of the menstruum until one pint of percolate has slowly passed. Should this contain a pronounced precipitate, add borax at intervals in small amounts until all or nearly all the sediment has dissolved. Filter the liquid and add the sugar to 14 fluidounces of it. Stir the mixture until most of the sugar has dissolved, and decant the syrup. On the residue pour the remaining filtrate, apply heat, and after solution add this syrup to the previous lot, and strain.—Drugg. Circ., Aug, 1886, 172.

Syrup of Hydriodic Acid—Extemporaneous Formula.—In reply to the query, how to secure a syrup of hydriodic acid that will remain colorless or nearly so, Mr. Donald L. Cameron reports that syrup of hydriodic acid must be kept in a cool place protected from the light, and proposes the following extemporaneous formula for its preparation: Mix together 68 grains of iodide of potassium, 60 grains tartaric acid, and ℥ss of water. Let the mixture stand on, and surrounded by ice, for two hours. Decant 200 minims of the clear liquid and mix with f℥v of simple syrup, U. S. P. ʒij contains one drop of hydriodic acid. Under the above restrictions, the syrup thus prepared has kept well for 18 months.—Proc. N. Y. State Pharm. Assoc., 1887, 173–174.

Syrup of Ferrous Iodide—Modification of Formula.—To the many papers already written on this subject, Mr. Otto George Miller adds another, in which he advocates the solution of 14 ozs. of sugar in 8 fluidounces of solution of ferrous iodide obtained from 2 ounces of iodine, heating to boiling, straining, bringing to the measure of 16 fluidounces, and immediately transferring to two-ounce vials which must be well filled, a bright sand-papered iron wire depending from the cork into the syrup. The vials are exposed to day-light.—West Drugg., Sept. 1886, 331.

Syrup of Nickel Bromide—Formula.—See *Nickel Bromide*, under "Inorganic Chemistry."

Syrup of Hypophosphites, U. S. P.—Precaution as to the Selection of its Components.—Mr. C. H. Bernhard observes that the formula of the Pharmacopœia will furnish an excellent preparation if care is taken to use pure hypophosphites, and in properly preserving the finished syrup. When exposed to the action of atmospheric oxygen a gradual transmutation of the hypophosphites to phosphites and eventually to phosphates takes place, with formation of precipitates. A far greater element of deficiency, however, is the unsatisfactory condition of commercial hypophosphites and of hypophosphorous acid. The latter often contains phosphoric acid and calcium; the lime salts are liable to contain phosphates and sulphates; the potassium and sodium salts are liable to be alkaline and to contain carbonate, sulphate and phosphate of calcium. The author regards the

Syrup of Hypophosphites with Iron to be a good preparation, being but slightly acid, elegant in appearance, and an efficient combination of the salts incorporated. He gives formulas for an *elixir* and a *wine*, which will be found under their proper headings.—Pharm. Rundschau, 1886, 196.

Syrup of Lactophosphate of Calcium and Iron—New Formula.—According to Mr. Thyssen, syrup of lactophosphate of iron is first made as follows: Dissolve 5 parts of lactate of iron in 40 phosphoric acid, add simple syrup 160 parts, oleosaccharate of lemon 4 parts, and simple syrup enough to make 1000 parts. To this syrup is added the syrup of lactophosphate of calcium made as follows: Calcium lactophosphate 3 parts, citric acid 1.2 parts, simple syrup to make 1200 parts; flavor with oil of lemon.—Rundschau, Leitmer., 1886, 517.

Syrup of Superphosphate of Iron and Oxygen—Preparation and Uses.—Dr. Richardson draws attention to a syrup of superphosphate of iron and oxygen, which is prepared by mixing equal parts of syrup of superphosphate of iron, solution of peroxide of hydrogen (10 volume strength) and glycerin; the latter being necessary to its stability. Dr. Richardson has found this combination useful in cases of a neuraesthenic type, especially when anæmia is present.—Pharm. Jour. and Trans., May 28, 1887, 970; from "Asclepiad," 135.

TINCTURÆ.

Tinctures—Determination of Quality.—Mr. C. Traub proposes the determination of the alcohol and residue of evaporation in tinctures, as leading to a far more reliable estimate of their character than the methods generally pursued. 50 grams of the tincture are subjected to distillation, the distillate is brought to 50 grams by water, and the alcohol determined by specific gravity. 10 grams of the tincture are evaporated in a small flask on the water bath at 70°—a partial vacuum being maintained in the flask by means of the suction pump—until three constant weighings are obtained.—Schweiz. Wochenschr. f. Pharm., 1887, 57.

Detannated Tinctures—Method.—Mr. Carl E. P. Meumann discusses the method of detannating tinctures by means of ferric hydroxide. In its dry condition it proves ineffectual, whilst when used as a magma it dilutes the tincture in undue proportion, and he therefore prefers to detannate the drug during the process of extraction. The method, which can be applied to any drug, is applied to the preparation of

Detannated Tincture of Cinchona as follows: a magma of ferric hydroxide is made from ferrous sulphate, oxidation of the same to ferric sulphate, precipitation by ammonia, washing, draining, and expressing, in the well-known manner. A portion of this is dried to constant weight and the amount of water retained by it thus ascertained. When well pressed the author finds that one pound of ferrous sulphate will yield a press cake weighing about 1½ pounds, containing in round numbers 6 ounces of ferric oxhydrate and 18 ounces of water. This magma is added to the finely powdered bark (the author fails to give the quantity of the latter, but possibly intends that one pound shall be used—*Rep.*), and intimately mixed. Taking into account the water that is contained in the magma, the corresponding proportions of glycerin and of alcohol to make the menstruum of the required strength are added, and the mixture is macerated until the clear filtrate is no longer darkened by ferric chloride. The mixture is then transferred to a percolator, the liquid allowed to percolate, and the percolation finished with the requisite menstruum and in the manner prescribed by the Pharmacopœia.—Pharm. Rundschau, 1887, 197.

In a second paper the author records some further experiments in which he endeavored to establish the relation of the ferrous sulphate to the magma of ferric oxhydrate, and to determine the quantity of ferrous sulphate, as ferric hydroxide necessary to the complete detannation of a weighed quantity of cinchona bark, as well as the time necessary for the operation. He finds that 100 parts of crystallized ferrous sulphate yield 110 parts of moist ferric oxhydrate, composed of 38.48 parts of dry hydrate and 71.32 parts of water, therefore nearly 35 per cent. of dry hydrate. Respecting the quantity of ferrous sulphate (as ferric oxhydrate) necessary for the detannation of a given quantity of cinchona bark, he finds by his experiments that a smaller quantity will answer, but recommends the proportion of 2 parts of ferrous sulphate to three parts of bark. Maceration for four days ends the process, though it may, under circumstances, be completed sooner.—Pharm. Rundschau, 1887, 270–271.

Tincture of Belladonna—Preparation from Standard Extract.—The following formula is suggested by Messrs. Dunstan and Ransom: Take of standard extract of belladonna (see under "Extracta"), 148 grains; distilled water, 4 fluid ounces; rectified spirit, a sufficiency. Dissolve the extract in the warmed water and add sufficient spirit to produce 20 fluid ounces. Allow any undissolved milk sugar to subside, and decant the clear solution. One fluid ounce of this tincture contains $\frac{3}{20}$ of a grain of total alkaloid.—Pharm. Jour. and Trans., April 16, 1887, 844–845.

Tincture of Opium—New Method of Assay.—See "Morphine," under Organic Chemistry.

Laudanum—Ready Method of Assay.—Mr. Charles Bullock observes that the resinous matter taken up by the dilute alcohol from opium presents an obstacle to the determination of the morphine contained in the tincture, and finds the following simple process to overcome the difficulty: The tincture is evaporated on a water-bath at a low heat to about one-fourth of its volume, to the fluid extract thus obtained pure kaolin is stirred in until a thick paste is formed; water is then added gradually with constant stirring to make a homogeneous mixture; this is transferred to a wet filter, and after the liquid has drained through, the contents of the filter are washed with water until the filtrate is clear and without bitterness. The solution first draining through the filter is set aside, and the washings are evaporated on a water-bath, and added to the reserved portion. The separation of the morphine is then effected after the process of Dr. E. R. Squibb.—Amer. Jour. Pharm., March 1887, 127.

Tincture of Opium—Relative Power of Solvents of Different Strengths.—Mr. Th. Schlosser has made experiments to determine the relative value of different alcoholic and watery solvents upon opium, based upon the amount of the morphine retained by the finished preparation. He found that by employing alcohol of 70 per cent., 69 per cent. of the morphine contained in the opium used was contained in the tincture; with 35 per cent. alcohol it retained 72.3 per cent. morphine; while with 25 per cent. alcohol it retained 73.3 per cent. By extracting the opium with 7 parts of water, and adding to the filtrate a sufficient amount of alcohol to correspond to a 25 per cent. alcohol, 75.1 per cent. of morphine was retained, while an aqueous extraction corresponding to the tincture retained 80 per cent.—Arch. d. Pharm., June 1887, 497; from Zeitschr. d. Oesterr. Apoth. Ver., 25, 191.

Tinctura Opii Deodorata, U. S. P.—Simplification of Process.—Mr. Ernest C. Federer offers the following simplified process as a substitute for the officinal one:

1. Macerate the dried and powdered drug in twice its weight of water

at about 138° F. (a mixture of 1 part water at about from 50° to 75° F. with 1 part at about 210° F.) over night, or about 12 hours, in a moderately warm place not above 80° to 90° F., in a partially closed flask.

2. Pour the mass into a wetted double precipitate filter; when the liquid ceases to pass, rinse out the flask with 1 part more of the water at about 138° F., and pass this through the mass. Repeat this once, and if necessary again repeat, so as to obtain 4 to 5 parts of moderately concentrated liquor; the residue will under these circumstances become exhausted.

3. Cool the percolate to as near to 32° F. as possible, and filter, placing a piece of ice in the filter to keep the temperature down. If necessary, repass the first portion until the liquid comes through clear; when the last portion has passed, wash the filter with sufficient ice water to obtain a filtrate of 8 parts; lastly add alcohol 2 parts.

A permanent, bright, clear tincture results, practically free from narcotine and thoroughly deodorized.—Drugg. Circ., April 1887, 77.

Tincture of Nux Vomica—Variation as Prepared by Different Manufacturers.—Mr. L. C. Hogan contributes an interesting paper on nux vomica, in which, among other experiments, he records the results obtained by thirty-five students in preparing the tincture from the same amount of drug, with the instruction to follow the pharmacopœial directions implicitly. The results, which are shown in the appended table, possess more than ordinary interest, since they furnish a reasonably correct criterion of the results obtained by the average manipulator. The conditions were the same as are to be found in any drug store, an ordinary prescription scale being used for weighing the extracts. It should be mentioned also that the students selected for this work had an experience of three to seven years, and were familiar with percolation.

The following table gives the results of the experiment:

No.	Specific Gravity of Finished Tincture . . .	Cubic Centimeters of Menstruum Required to Exhaust 50 Grams . .	Per Cent. of loss in Menstruum. .	Per Cent. Extractive Obtained .	Relation of Height to Diameter of Column of Powder after Packing. . . .
1	.944	380	. .	2.	4 : 2
2	.844	400	37.5	2.4	
3	.888	685	12	3.	2 : 1
4	.889	325	. .	3.6	3 : 1½
5	.880	325	10.66	3.3	2½ : 2
6	.855	350	14	1.5	3½ : 1
7	.866	500	. .	3.2	2 : 1
8	.870	550	20	3.6	3 : 1¼
9	.860	300	. .	2.4	2 : 1
10	.874	400	15	2	3 : 1¼
11	.880	410	19	2	2 : 1¼
12	.868	350	. .	2.94	
13	.868	480	. .	2.7	
14	.880	325	15.5	3.6	3 : 1
15	.868	335	27	3	2 : 1
16	.968	465	8.6	2	4 : 1
17	.860	300	75	. .	3½ : 1¼
18	.870	400	11	10	3½ : 1½
19	.872	650	. .	2.4	
20	.860	525	20	2	3 : 1½
21	.860	325	4.3	3	3 : 1½
22	.880	450	. .	3.2	4 : 1
23	.870	450	11	2	3¼ : 1¼
24	.865	325	22	2.6	2 : 1
25	.848	325	22	2.5	2 : 1
26	.878	335	. .	2.2	2 : 1
27	.850	325	22	2.5	4 : 1
28	.856	370	40	2.8	2 : 1
29	.860	350	20	1.4	
30	. .	325	18	1.5	2 : 1½
31	.855	400	18.6	2.2	
32	. .	325	23	1.4	3 : 1½
33	.884	325	21	2	
34	.875	340	35	2	3 : 1
35	.884	325	21	2	2 : 1

We have an average specific gravity of .8736, and the volume of menstruum required to exhaust ranging from 300 cubic centimeters (the lowest) to 685 cubic centimeters (the highest), the average being 393.14 cubic centimeters.—Nat. Drugg., 1887, Feb. 18, pp. 80–81, and April 15, pp. 176–177.

Tincture Nux Vomica, B. P.—Examination of commercial samples, and criticism of the B. P. method of standardizing, see *Nux Vomica*, under "Materia Medica."

Tincture of Strophanthus—Preparation from the Seeds.—Mr. W. Martindale communicates the result of some experiments to determine the best method for preparing the tincture of strophanthus seeds. It has been recommended by Dr. Frazer to prepare this tincture from the seeds which have previously been deprived of their fixed oil by ether, and it is asserted that the active principle, strophanthin (see Proceedings 1886, 647), remains in the seeds undisturbed by the treatment with ether. Mr. Martindale's experiments point out that this is practically the case, the fixed oil possessing very little activity, though not absolutely inert. He finds that the most active preparation is obtained from the seeds, as stated by Dr. Frazer and others, and prepares it in the proportion of 1 p. to 8, by first extracting the seeds with ether, sp. gr. 0.720, drying the exhausted seeds, and then extracting them by percolation with rectified spirit. He is not sure, however, that all of the active principle is thus extracted, for the subsequent percolate, though nearly colorless, is quite bitter; and the marc, after passing 20 p. of tincture, still has a bitter taste. Tincture prepared in the proportion of 1 to 8 from the pods and hairs also possesses some activity, but inferior to that of the seeds, the tincture of the hairs being the weakest.—Pharm. Jour. and Trans., Nov. 20, 1886, 411, 412.

Tincture of Strophanthus—See *Strophanthus*, under "Materia Medica."

Tincture of Rhatany—Amount of Extractive and Comparison of the Preparations made from Para and Peruvian Roots.—Messrs. J. O. Braithwaite and E. H. Farr have determined the amount of extract in tinctures of rhatany which they had carefully prepared from fair samples of Para rhatany (Krameria argentea), and Peruvian rhatany (K. triandra). The amount of extractive in four samples of tincture from Peruvian rhatany amounted to 27.12, 24.96, 25.04, and 27.60 per cent. of the root employed, whilst those prepared from two samples of Para rhatany yielded 21.52 and 26.72 per cent. respectively. The tincture made from Para rhatany forms a bright mixture with water in all proportions; that prepared from Peruvian rhatany becomes turbid on adding water. The former was found to be a trifle more astringent than the latter, but in other respects there is little difference. The authors observe that a better tincture is obtained if the maceration is prolonged beyond 48 hours, and that the temperature (? Rep.) also has a marked influence on the product. —Pharm. Jour. and Trans., Nov. 1886, 399.

Tincture of Kino—New Formula.—Mr. R. Rother, after stating his reasons at length, suggests the following as a substitute for the officinal formula for tincture of kino, and claims that the product is characterized by permanence: Powder one and a half troy ounces of kino and half a troy ounce of catechu, mix them, add ten fluidounces of water, heat for 10 or 15 minutes with constant stirring, and let the mixture cool. Add water to make the mixture measure twelve fluidounces, and then add four fluidounces of alcohol. Pour the mixture into a bottle containing sixty grains of filter paper, shake the whole well at intervals and strain the tincture after twenty-four hours.—Amer. Jour. Pharm., July 1886, 333–336.

Tincture of Orange Peel—Preparation for Making the Syrup.—Mr. R.

Rother recommends the following formula for making a tincture of orange peel that is well suited to make the syrup (which see) by simple admixture:

℞. Fresh orange rind.	
Alcohol, of each sufficient to make	1 pint.
Oil sweet orange	1 fluidram.
Magnesium oxide	1 dram.

Any convenient and sufficient quantity of the fresh orange rind is exposed in the open air until perfectly dry, and is then cut into thin shreds. Two and a quarter troy ounces of this is then mixed with 14 fluidounces of alcohol and set aside for three days, being occasionally shaken. Eight fluidounces of the supernatant liquor is then decanted. The residue is again mixed with eight fluidounces of alcohol and decanted after three days as before. The oil of orange, magnesium oxide and the two decantates are now mixed, and the tincture is filtered off after 24 hours.—Drugg. Circ., Aug. 1886, 171.

Tincture of Pulsatilla.—For method of preparation, see *Anemone Pulsatilla* under "Materia Medica."

Essence of Musk.—Preparation from "*American*" *Musk*, which see under "Materia Medica."

Ethereal Tincture of Chian Turpentine—Preparation.—Mr. Henry Campbell communicates the following method for preparing an ethereal tincture of Chian turpentine, which he uses in its turn for making the emulsion (see under "Misturæ"): Put a convenient quantity of the turpentine in a wide-mouthed bottle, with an equal bulk of ether, cork well, shake frequently, allow to deposit, decant the clear liquid, and ascertain the amount of turpentine dissolved by evaporating a small portion of the same.—Pharm. Jour. and Trans., Dec. 4, 1886, 445.

Extract of Vanilla—Comparative Value of the Rind and Pulp of the Bean for its Preparation.—Mr. Clay W. Holmes, in view of the assertion of experienced confectioners that the pulp of vanilla is the portion containing the true flavoring principle, and that the rind may be discarded as worthless, has made some experiments with a view to determining the reliability of this assertion. His results lead him to the conclusion that while the rind contributes much body to an extract of vanilla, the delicacy of flavor lies in the pulp. The proper solvent appears to be a menstruum composed of 3 parts of cologne spirits and 1 part of water. This menstruum does not seem to be quite as well adapted to the rind as dilute spirit, but the difference is so slight as to be overcome by the greater value of the pulp flavor.—Proc. N. Y. State Pharm. Assoc., 1887, 182–184.

Tinctura Ferri Acetatis, B. P., 1885—Liability to Change.—Mr. Thomas Stephenson draws attention to the extreme liability of the tincture of acetate of iron of the B. P., 1885, to change. He has tried various expedients, such as the addition of alcohol, excess of acid, etc., but none of these prevented the formation of deposits during various periods reaching to ten days. He has also prepared the tincture by formulas suggested at different times, but finds the most practical way is to keep the "liquor" instead of the "tincture" in stock, and making the tincture extemporaneously from the liquor.—Pharm. Jour. and Trans., Dec. 18, 1886, 495.

Mr. J. Mackenzie, referring to the above strictures on the tincture of ferric acetate, states that his experience with some tincture made immediately after the appearance of the B. P., 1885, and in strict accordance with the same, has been most favorable. The tincture, though kept from the direct sunlight, has kept perfectly, and a sample exposed for six days to the direct sunlight, and in a warm place, shows no evidence of change. Boiling the tincture in a test tube also gave no indication of precipitation or other change, except that it is somewhat darkened.—Pharm. Jour. and Trans., Jan. 29, 1887, 619–620.

TRITURATIONES, ETC.

Tablet Triturates.—A resumé of Dr. Robert M. Fuller's description of his method of making the small lozenge-shaped tablets, known as tablet triturates, as communicated by him in the "Medical Record" (March 9, 1879, and March 25, 1882), is given in "American Druggist," January 1887, 1–2, together with some practical comments and illustrations showing the apparatus employed for their preparation.

Terebene Tablets—Formula.—The following formula is given in "Pharm. Zeitschr. f. Russl." (xxvi., 191): Terebene, 15; powdered gum arabic, 12; distilled water, 60; pulverized sugar, 180; powdered tragacanth, 80. Make 100 tablets. The terebene is emulsified with gum and water, and then the mixture of sugar and tragacanth added.

Aconite Tablets—Formula.—Mr. P. Vigier recommends the preparation of tablets of aconite as a convenient form for administering the tincture. 200 drops of tincture of aconite root (Pharm. Française*), 50 grams of sugar, 0.5. gram tragacanth, and 5.0 gm. of orange flower water are made into a mass, which is divided into 100 tablets.—Amer. Jour. Pharm., Sept. 1886, 428; from Gaz. Hebdom. Méd.

TROCHISCI.

Troches—Excipients, etc.—Mr. Ellsworth S. Adams, after experimenting with various excipients for troches, observes that currant paste deserves to be more frequently used, and that a jelly prepared from starch and gum arabic furnishes one of the best general excipients: powdered

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* This is just one-half the strength of the tincture of aconite root of the U. S. Pharm.

gum arabic and starch, of each 1 oz., are well mixed, triturated with 3 fluidounces of water, and the mixture heated to boiling until solution has been effected. A useful

Diarrhœa Lozenge was prepared by the author from powdered opium, 12 grains; tannin, 50 grains; aromatic powder, 250 grains, and sufficient of the starch excipient, the mass divided into 12 lozenges.—Amer. Jour. Pharm , Nov. 1886, 538.

VINA.

Wine of Ipecacuanha—Cause and Prevention of Precipitation.—The instability of wine of ipecac has been the subject of numerous papers for the past few years (see Proceedings 1886, 359), the cause of precipitation being in most cases attributed to the presence of tannic acid in the wine. Mr. J. C. Shenstone has now communicated some experiments which tend to show that whilst the presence of tannic acid in the wine greatly enhances the amount and rapidity of the precipitation, its absence by no means prevents the change. He had selected for his experiments natural wines which were practically free from tannic acid, and in every case following the method of the Br. Pharm., obtained preparations in which precipitates were formed after a greater or less length of time. The addition of alcohol, acetic or malic acids, sugar or glycerin, did not prevent the formation of precipitates, though with sugar or glycerin the change was retarded, the amount also being much less. He obtained the best results with a mixture of alcohol, water, malic acid and glycerin, the following formula being employed :

Spir. vini. rect., 23 parts; glycerin, 10 parts; malic acid, 0.5 part; water, 67 parts; extract rad. ipecac, B. P. proportion.

This preparation shows no signs of changing after three months; and while the author is not prepared to recommend the modification as absolutely reliable, he thinks that it may serve to point out the direction in which final perfection may be attained.—Yearbook of Pharm., 1886, 546–551.

Wine of Cinchona—Cause of Turbidity, and Prevention.—Mr. E. Mylius ascribes the tendency of cinchona wine to become turbid to the cinchona-red, and not to the tannic acid. He recommends the removal of coloring matter by treating the alcoholic or watery extraction of the bark with lime. (The author does not mention how he secures the solution of the alkaloids, which must be precipitated at the same time.—Rep). —Arch. d. Pharm., Dec. 1886, 1026; from Pharm. Centralh., 1886, 27, 515 et seq.

Cinchona Wine, P. G.—Desirability of Omitting the Glycerin.—Mr. O. Liebreich regards the introduction of glycerin into cinchona wine of the Pharm. Germ. a mistake. He submits that the wine is used not so much on account of the alkaloids it contains, but equally on account of the tonic qualities of the tannic acid, and that the effect of the latter is to a great extent neutralized by the introduction of glycerin.—Arch. d. Pharm., March 1887, 218; from Therap. Monatshefte and Pharm. Centralh.

Cinchona Wine.—In reply to Mr. Liebreich's restriction respecting the pharmacopœial wine of cinchona, Mr. C. Schacht states that the revisers of the Pharm. Germ. did not expect a large content of the alkaloids, nor lose sight of the cincho-tannic acid as a valuable constituent, which latter, he maintains, as well as cinchona red, enter its composition in the desirable quantities. As to the addition of glycerin, and its neutralizing effect upon the tannic acid, he observes that the eighteen members of the commission held a different opinion from that expressed by Liebreich.—Arch. d. Pharm., June, 1887, 497; from Apoth. Ztg., No. 34.

Wines of Condurango—Formulas.—The following formulas for wines of condurango are given in "Rundschau," Prag, xii, 751:

Vinum Condurango.—100 grams of true Ecuador condurango and 50 grams of gentian root are macerated in a liter of Madeira wine for five days, expressed, and sufficient Madeira wine is added to make 1 liter; filter.

Vinum condurango ferratum is made by dissolving 20 grams of citrate of iron in one liter of wine of condurango.

Vinum condurango cum pepsino consists of equal parts of condurango wine and wine of pepsin.

Vinum Condurango—Preparation.—Dr. G. Vulpius reviews the various methods for the preparation of condurango wine which have from time to time been proposed as possessing superiority over others, and arrives at the conclusion that its preparation, by macerating the coarsely powdered bark for eight days in 10 parts sherry wine, expression and filtration, leaves nothing to be desired.—Arch. d. Pharm., Nov., 1886, 970–974.

Wine of Hypophosphites—Preparation.—Mr. C. H. Bernhard recommends the preparation of a wine of hypophosphites corresponding to the officinal syrup of hypophosphites. The components given are precisely the same as in his formula for *Elixir* (which see under "Elixires") with this difference, that the glycerin is replaced by 2 ounces of simple syrup, and the elixir of orange by sufficient stronger white wine to make one pint.—Pharm. Rundschau., 1886, 197.

Vinum Ferri Amarum—French Method of Preparation.—This preparation forms a component part of a formula which has been largely called for in Paris of late on account of its great success in the treatment of anæmia, especially where the latter is deeply seated and occurs with anorexia. It appears in the *Ann. Clin.* of Masius, as follows: Vini ferrat. am., 120 gm.; Tr. nucis vom., 8 gm.; sol. Fowleri, 4 gm. (ʒi. t. i. d., after eating). The formula for vinum ferratum amarum used in the above is given in *Le Prog. Méd.*, April 9th. American physicians, it is said, are likely to prescribe it. Cinchona bark, 300; gentian, 200; iron citrate, 300; Marsala wine, 11,700; brandy, 900; alcohol, 900; essence of orange, 18; sol. ferric sulphate (10 per cent.), 1800; sugar, 1800; ammonia, q. s. The essence, with a little alcohol, is mixed with the wine and brandy. With this, macerate the cinchona and gentian until 13,500 gm. have been displaced with water. Dilute the solution of ferric sulphate with twice its weight of water, and add ammonia to excess. Wash the precipitate and let it drain; mix this with the tincture obtained, stirring often, until a yellow color is obtained, which does not darken with tincture of ferric chloride. Then dissolve in it the ferric citrate and the sugar, and dilute to 14,400 gm. Thirty grammes contain 0.60 cinchona, 0.40 gentian, and 0.60 citrate of iron.—Amer. Jour. Pharm., June 1887, 297.

MISCELLANEOUS FORMULAS.

Surgical Dressings—Preparation According to the Direction of the French Military Authorities.—The methods of preparing

Charpie (lint) for surgical dressings are laid down by the French military authorities with great precision. To purify the charpie, four litres of boiling water are to be poured on each kilogram; this is to be allowed to cool, and the charpie is then to be removed and washed freely in fresh water until the water passes off perfectly clear. The charpie, after the water has been pressed out, is next to be soaked for three-quarters of an hour in six litres of a solution, 1 in 30, of chloride of lime, and again washed in water until all odor of the chloride has disappeared. The charpie is then put into six litres of dilute hydrochloric acid, 1 in 30, and, half-an-hour afterwards is withdrawn and washed, until it does not redden litmus paper. It is now pressed, dried, and rubbed until it is sufficiently supple. The following are the preparations employed for rendering the purified charpie antiseptic.

Mercurial Charpie (*Charpie bichlorurée*).—1 gram of the bichloride of mercury is dissolved in 100 grams of alcohol; and this solution, together with 10 grams of glycerin and 10 grams of Senegal gum, is added to 2½ kilograms of distilled water. Into this solution 1 kilogram of the purified charpie is plunged; and in order to distribute the bichloride throughout its substance, the liquid is pressed out and reabsorbed several times. It is then withdrawn, dried, and packed.

Boric Charpie.—100 grams of crystallized boric acid are dissolved in a sufficient quantity of water; 100 grams of glycerin and 20 grams of Senegal gum previously dissolved, are added to the solution, and pure water is added to make up the amount to 2½ kilograms. One kilogram of charpie is treated in this solution in the same manner as has been described with the mercurial charpie.

Carbolized Charpie.—To prepare this two plans are given, but the following is the one recommended as the most simple and equally effective. A layer of the purified charpie is laid on a piece of oiled silk (*taffetas gommé*) and over this is placed a piece of filtering paper of sufficient size. The paper is sprinkled with carbolic acid dissolved in alcohol of 95% strength. The whole is then rolled up in the oiled silk, secured firmly by cord, and placed at a temperature ranging from 68° to 77° F. If the charpie is required to be carbolized 10 per cent. the blotting paper is sprinkled with 100 grams of the carbolic acid dissolved in 50 grams of alcohol at 95°; if 5 per cent., then with 50 grams of the carbolic acid in 50 grams of alcohol at 95°.—Brit. Med. Jour., March 12, 1887.

Antiseptic Dressings—Directions of the German Military Authorities.—The following directions are given in "Pharm. Rundschau," Prag, for antiseptic dressings to be used in the German army:

Corrosive Sublimate Gauze.—Dissolve mercuric chloride 50 gm. in alcohol 5000 gm., and add distilled water 7500, glycerin 2500, and fuchsin 0.5 gm., the latter being added for the purpose of readily distinguishing the corrosive sublimate gauze from others. Four hundred meters of gauze are well kneaded in this solution and allowed to soak for 15 minutes; the gauze is then strongly pressed and well dried on washlines, being protected from light and dust. It takes about nine hours for the complete drying of this gauze, but the time may be shortened by replacing the water partly or wholly with alcohol.

Corrosive Sublimate Cotton.—Absorbent cotton is soaked in the above solution and dried in loose layers.

Corrosive Sublimate Catgut.—A 5 per cent. aqueous solution of corrosive sublimate is prepared, in which thin catgut is soaked for about 8 hours, and the thicker kinds for 10 or 12 hours. The catgut is subsequently kept in vials with alcohol.

Corrosive Sublimate Silk is prepared by soaking well-washed ligature silk in a solution of 5 parts of corrosive sublimate in 100 parts of water and 20 parts of glycerin. After drying it is wrapped in oiled silk or other water-proof material; and before using, it is dipped into a 3 per cent. phenol solution, or a one per cent. solution of corrosive sublimate.

Antiseptic Cottons and Gauzes—Formulas.—Mr. Joseph W. England makes some practical remarks on the preparation of antiseptic cottons and gauzes. He observes that these, while extensively used in surgery, are prepared to a limited extent only by pharmacists. Their preparation, however, involves no especial difficulty in work or appliances, and opens a new field to the pharmacist who is desirous of extending his work in all profitable directions of his profession. To encourage this the author communicates a number of practical formulas, which are briefly given in the following:

Borated Cotton.—

Boric acid	80 gm. (2 oz. av. and 360 grs.)
Boiling water	1814 gm. (4 lb. av.)
Absorbent cotton	453.5 gm. (1 lb. av.)

Dissolve the acid in the boiling water, impregnate the cotton, express and dry by exposure to the air or slight heat. Borated cotton thus made contains exactly, in the finished product, 15 per cent. of its weight of acid. The use of a Trœmner solution balance, will greatly facilitate the weighing of quantities in this, as well as in all other formulas herein given.

Benzoated Cotton.—

Benzoic acid	90 gm. (3 oz. av. 76 grs.)
Boiling water	1814 gm. (4 lb. av.)
Glycerin	57 gm. (2 oz. av.)
Absorbent cotton	453.5 gm. (1 lb. av.)

Proceed as before. The product contains 15 per cent. acid.

Salicylated Cotton.—

Salicylic acid	57 gm. (2 oz. av.)
Alcohol	453.5 gm. (1 lb. av.)
Hot water	2268 gm. (5 lb. av.)
Glycerin	57 gm. (2 oz. av.)
Absorbent cotton	453.5 gm. (1 lb. av.)

Mix the acid, in a porcelain or wedgwood mortar, with the glycerin, dissolve with added alcohol, place the solution in a large, flat, open vessel and lay upon the surface of the liquid the cotton in thin layers. After standing for ten minutes in this liquid and absorption is completed, remove, express and lay aside to dry upon a frame. It contains 10 per cent. of acid.

Naphthalinated Cotton is made by soaking absorbent cotton, in thin layers, in a saturated solution of naphthalin in petroleum benzin, which dissolves about one part of the former to six parts of the latter, expressing and drying. The following is the formula:

Naphthalin	453.5 gm. (1 lb. av.)
Petroleum benzin	2732 gm. (6 lb. av.)
Absorbent cotton	453.5 gm. (1 lb. av.)

Iodoformized Cotton.—

Iodoform	24 gm. (370 gr.)
Ether	250 gm. (8 oz. av., 358 gr.)
Alcohol	750 gm. (26 oz. av., 198 gr.)
Absorbent cotton	453.5 gm. (1 lb. av.)

Dissolve the iodoform in the ether, add the alcohol and proceed in the usual way, or, if desired, the cotton may be prepared extemporaneously by rubbing the iodoform thoroughly into it and shaking out any excess. As made above, it contains 5 per cent. but can be increased to a much greater strength if wished.

Carbolized Cotton.—Any value that it may possess at first, which is questioned, is almost *nil* after keeping for a time, from the volatility of its active constituent, and it is seldom if ever employed, especially in view of the great superiority of the carbolized gauze. It is best made by soaking sufficient absorbent cotton in a one per cent. solution of carbolic acid in ether, drying at once and using immediately.

Sublimated Cotton.—

Corrosive sublimate	2.5 gm. (39 gr.)
Alcohol	57 gm. (2 oz. av.)
Water	1814 gm. (4 lb. av,)
Glycerin	57 gm. (2 oz. av.)
Absorbent cotton	453.5 gm. (1 lb. av.)

Dissolve the sublimate in the alcohol, add the water and glycerin, impregnate the cotton, and proceed in the usual way.

Carbolized Gauze.—The following formula contains 10 per cent. in weight of carbolic acid, in the finished product:

Carbolic acid	239 gm. (8 oz. av., 188 gr.)
Alcohol	1200 gm. (42 oz. av., 144 gr.)
Glycerin	150 gm. (5 oz. av., 127 gr.)
Resin	300 gm. (10 oz. av., 255 gr.)
Benzin	1400 gm. (49 oz. av., 168 gr.)
Gauze	1700 gm. (59 oz. av., 423 gr.)

Triturate the resin in a mortar with the benzin, add the alcohol, in which has been dissolved the carbolic acid, and then add the glycerin.

Lastly soak the gauze, in 3 or 6 yard pieces, in this mixture, kneading well, to secure uniform diffusion; express and hang the gauze on frames to dry. It dries very quickly, after which fold in rolls and wrap up in paraffin paper. In order to increase the efficiency of the gauze, it has been recommended that the layers of gauze, prior to application, be dipped in a 1 to 40 aqueous solution of carbolic acid.

Sublimated Gauze.—This, by the following formula, contains 1 part in 2000, or $\frac{1}{20}$ of one per cent. of its active constituent:

Corrosive sublimate	0.85 gm. (13 gr.)
Alcohol	28.5 gm. (1 oz. av.)
Water	2268 gm. (5lb. av,)
Gauze	1700 gm. (59 oz. av., 423 gr.)

Dissolve the sublimate in the alcohol, dilute with water, and treat the gauze in layers with the liquid. Hang up to dry.

Absorbent Canton Flannel.—In connection with the above the author draws attention to canton flannel, rendered absorbent, which is used in the Philadelphia Hospital. It is rendered absorbent by boiling in a 3 per cent. solution of caustic soda for 1½ or two hours, until all the fatty matter in the fibres is decomposed, then washing in several portions of cold water, then macerating for 10 or 15 minutes the product in a 1.5 per cent. solution of hydrochloric acid, whereby any traces of free soda are neutralized, and the fibres of the goods are whitened; and, lastly, followed by several washings in water, wringing out with a machine and drying. This product has been found to be peculiarly serviceable in hospital practice, as a cheap, efficient and reliable substitute for all the minor cases where at present the so-called patent lint is generally demanded.—Amer. Jour. Pharm., April 1887, 173–179.

Absorbent Wool—A Substitute for Absorbent Cotton.—This by-product in the manufacture of wool-fat or lanolin, is coming into use as a substitute for absorbent cotton, over which it is said to have the advantage of greater absorbing power for liquids, and of much greater elasticity.—Amer. Jour. Phar., June 1887, 293.

Iodated Cotton—Preparation.—Mr. Quinard proposes the preparation of iodated cotton by scattering the finely pulverized iodine over it as evenly as possible, and, placing it in a wide-mouthed glass-stoppered flask, exposing it to light, or, if possible, to the sun. In a week the iodine vaporizes and forms upon the cellulose.—Arch. de Pharm., June 1887.

Adherent Iodoform Gauze—Billroth's Formula.—Mr. Ghillany communicates the following formula for preparing Billroth's iodoform gauze: Glycerin, 500 grams; colophonium, 1,000 grams; alcohol, 10,000 grams; iodoform, in fine powder, 4 grams; bleached organtin, 200 meters.—Arch. d. Pharm., Dec. 1886, 1026.

Oiled Silk—Cause of Deterioration.—Mr. Balland has experimented to determine the cause of change in oiled silk, and concludes that the change is due to the presence of sulphuric acid. This, he considers, is without doubt introduced by the preparation of boiled linseed oil with the aid of metallic sulphates, the acid being freed by the influence of moisture. By employing boiled oil prepared by other means, the deterioration of the oiled fabrics made from it can doubtless be avoided.—Arch d. Phar., March 1887, 270; from Jour. de Pharm. et de Chim., 1887, xv, 18.

Disinfectants—Various Formulas.—A "Practical Pharmacist" discusses the subject of disinfectants in their different applications, and recommends the following formulas as serving most purposes:

For sinks, sewers and vaults, the following is effectual and cheap:

Sulphate of iron	20	parts.
Sulphate of zinc	5	"
Chloride of sodium	8	"
Sulphate of lime	30	"
Carbolic acid	2	"

Make into a powder and use freely by scattering among and about the offensive matter.

The best disinfectant (germ killer) to use in times of infectious disease is a mixture of

Chloride of lime	10 parts.
Corrosive sublimate	1 part.
Powdered French chalk	19 parts.

Thoroughly mix and apply to and about the offensive matter.

Another powerful antiseptic, and disinfectant as well, is chlorine.

A formula particularly suited for privy vaults and sewers is the following:

Chloride of lime	4 lbs.
Corrosive sublimate	4 ozs.
Sulphate of lime	27 lbs.
Chloride of sodium	9 lbs.

Mix and pack in 4 oz. or 8 oz. paraffined boxes.

Another most excellent disinfectant of the chlorine series is made by taking

Corrosive sublimate	1½ ozs.
Chloride of sodium	5 ozs.
Permanganate of potash	1½ ozs.
Water	10 gallons.

This preparation is highly poisonous of course, and should only be dispensed in carefully labeled bottles. Its use is for privy vaults, sewers, etc.

Many of the bottled disinfectants now on the market are solutions of chlorides; and the retail apothecary can make a preparation of his own as good as the manufactured products by using the following formula:

Chloride of sodium	10 lbs.
Chloride of zinc	5 lbs.
Chloride of calcium	5 lbs.
Chloride of magnesium	5 lbs.
Chloride of aluminium	15 lbs.
Water	100 gallons.

Mix in a large wooden tank and bottle in quart bottles.

A very cheap deodorant is made by the following formula:

Sulphate of iron	20	lbs.
Sulphate of alumina and potash	10	lbs.
Sulphate of zinc	3½	lbs.
Sulphate of lime	26½	lbs.
Granulated charcoal	5	lbs.

—Drugg. Circ., June 1887, 125.

Eulyptol-Composition.—Dr. Schmeltz has given the name "Eulyptol" to a new antiseptic, which he regards to be a perfect chemical compound, since one of its constituents, phenol, cannot be determined in it by the usual reagents. It is composed of 1 p. oil of eucalyptus, 1 p. phenol, and 6 p. salicylic acid. It was originally used by Dr. Schmeltz externally as a substitute for iodoform, corrosive sublimate, or carbolic acid, but is now employed by him internally in catarrhal affections, rheumatism and diseases of the bladder.—Arch. d. Pharm., Dec. 1886, 1037; from Jour. de Pharm. et de Chim., 1886, xiv., 414.

Iodoform Pencils—Formulas.—The following formulas are given in "Pharm. Zeitschr. f. Russl." (xxv., 760.):

No. 1. Iodoform powdered 50, starch (or gum arabic) 5, distilled water 9.5; make pencil 8 centimeters long and 4 millimeters thick.

No. 2. Iodoform powdered 5, starch or gum arabic 0, glycerin 9.5; make a pencil 6 centimeters long and 1 centimeter in thickness.

Menthol Pencils—Preparation.—Mr. Wm. G. Nebig states that menthol pencils cannot be made with the addition of thymol, chloral or camphor, all of which cause the menthol to liquefy at ordinary temperatures, producing, even on the addition of an equal bulk of spermaceti, a mass too soft for compression into a definite shape. Some of the commercial menthol pencils consist of pure menthol, melt at 44° C., are freely and completely soluble in hot alcohol, chloroform, ether, carbon bisulphide, and oil of peppermint, and on being gently heated are completely volatilized. The author has found the pencils of three manufacturers to be always of this behavior, and to consist of pure menthol. The product from four other manufacturers contained between 30.5 and 69.25 per cent. of paraffin, began to melt between 39° and 41° C., and were completely liquefied at from 43° to 59° C. These cones were soluble in benzin, benzol, carbon bisulphide, chloroform, and fixed oils; also in boiling alcohol, a white mass being deposited on cooling.—Amer. Jour. Pharm., Nov. 1886., 539–540.

Menthol Cones—Variation.—Mr. C. L. Coffin has examined twenty-two menthol cones of different manufacturers, and finds them very variable in composition. Starting with menthol as the proper constituent, he finds only one that is composed of menthol alone; the others contain foreign substances, such as paraffin, wax, ceresine, salicin, spermaceti, sugar, etc., in quantities varying from 5, 10, 20 to as high as 75 per cent. The author gives a description of what he considers should be the character of a pure menthol cone, but fails to describe how such cone shall be made.—Drugg. Circ., July 1886, 147.

Toothache Drops—New Formulas.—Dr. Gaudet recommends the following: Dissolve mastic 8 parts in chloroform 14 parts and add balsam of Peru 5 parts. A few drops upon a little cotton are to be introduced into the cavity of the tooth. Another formula is given by Dr. Gsell-Feltz, as follows: Liquefy camphor and chloral hydrate, of each 5 parts, and add cocaine 1 part. A pellet of cotton soaked in this liquid and introduced into the cavity of the aching tooth is said to afford complete and lasting relief.—Amer. Jour. Pharm., Dec., 1886, 597.

Toothache Drops—New Formula.—The following formula is recommended in "L' Union Médicale:" Alcoholic extract of opium, camphor, balsam of Peru, of each, 1 p.; mastic, 2 p.; chloroform, 20 p.—Amer. Jour. Phar., Feb., 1887, 72.

Toothache Drops—Dr. Magitot's Formula.—The toothache drops of Dr. Magitot consist of chloroform, tincture of opium and creasote of each 2 grams, tincture of benzoin 6 grams.—Les Nouveaux Remèdes, ii, p. 338.

Sal Pepticus; Peptochloride of Sodium; Digestive Salt.—Dr. Prosser James proposes these names for a mixture of chloride of sodium and pepsin, which has been found useful in cases of dyspepsia.—Brit. Med. Jour., 1886.

Galazyne—Formula.—Dr. Dujardin-Beaumetz gives the following formula: Brewers' yeast 4 grains, sugar 10 grams, cow's milk 1 liter. Dissolve the sugar and yeast in a little water, add to milk and keep securely corked in a cool place. The product contains from 1 to 2 per cent. of alcohol. —Rundschau (Prag.) xii, 893.

Show Colors—Practical Receipts.—Mr. G. H. Dubelle communicates the following formulas for preparing show colors which, while not absolutely new, may find place here for convenient reference. The author observes that the liquids, excepting those containing chromates or bichromates, must be protected against freezing by substituting equal parts of alcohol and glycerin for a portion of the water directed. This addition will vary in proportion from one-fourth to one-half of the whole, according to the severity of the winter. Show colors should not be filtered through paper, but through sand, powdered glass, or glass wool. Distilled water should be used, and if not freshly distilled, it should be boiled. The following colors are durable and transparent:

YELLOW.

	Parts.
Distilled water	970
Nitric acid	20
Bichromate of potassium	10

Another.

	Parts.
Distilled water	950
Bichromate of potassium	30
Carbonate of sodium	20

Another.

	Parts.
Distilled water	910
Bichromate of potassium	45
Carbonate of sodium	45

ORANGE.

	Parts.
Distilled water	960
Bichromate of potassium	32
Nitric acid	8

BLUE.

	Parts.
Distilled water	920
Blue vitriol	30
Alum	30
Sulphuric acid	20

PALE BLUE.

	Parts.
Distilled water	880
Sulphate of copper	120

Another.

	Parts.
Distilled water	920
Sulphate of copper	75
Sulphuric acid	5

DARK BLUE.

	Parts.
Distilled water	950
Ammonia water	40
Sulphate copper	10

PURPLE BLUE.

	Parts.
Distilled water	930
Ammonia water	64
Sulphate of copper	6

GREEN.

	Parts.
Distilled water	840
Sulphate of copper	90
Muriatic acid	80

Another.

	Parts.
Distilled water	900
Verdigris	100

Sulphuric acid, a sufficient quantity.

GRASS GREEN.

	Parts.
Distilled water	930
Sulphate of copper	35
Sal ammoniac	35

SEA GREEN.

	Parts.
Distilled water	960
Acetic acid	36
Acetate of copper	4

PEA GREEN.

	Parts.
Distilled water	990
Nitric acid	8
Nickel	2

Bichromate of potassium, a sufficient quantity.

OLIVE GREEN.

	Parts.
Distilled water	890
Sulphate of copper	70
Muriatic acid	32
Subcarbonate of iron	8

DARK GREEN.

	Parts.
Distilled water	960
Ammonia water	36
Sulphate of copper	4

Bichromate of potassium a sufficient quantity.

PINK.

	Parts.
Distilled water	950
Nitric acid	49
Oxide cobalt	1

CRIMSON.

	Parts.
Distilled water	960
Hydrochloric acid	36
Iodine	2
Iodide of potassium	2

VIOLET.

	Parts.
Distilled water	950
Ammonia	40
Cudbear	10

RED.

	Parts.
Distilled water	970
Sulphuric acid	20
Cochineal	6
Bitart. potassium	4

BRIGHT RED.

	Parts.
Distilled water	970
Sulphuric acid	10
Cochineal	8
Alum	8
Pure cream tartar	4

DARK RED.

	Parts.
Distilled water	980
Iodide of potassium	10
Alum	10

BLOOD RED.

	Parts.
Distilled water	880
Ammonia water	76
Nitric acid	32
Cobalt metal	8
Alum	4

—Drugg. Cir., Dec. 1886, 268.

Polishing Pomade—Formula.—The following formula is given in "Rundschau," (1886, 435), and is said to yield a good product: Oxalic acid, 1 part; ferric oxide, 25 parts; tripoli, 20 parts; palm oil, 60 parts; soft paraffin, 4 parts.

Cement.—According to "Rundschau" (1886, 435), a cement which is not affected by boiling sulphuric acid is made by melting caoutchouc at a moderate heat and adding 3 per cent. of suet, stirring constantly, then adding a sufficient quantity of slaked lime to give it the consistency of soft dough; lastly 20 per cent. of red oxide of lead is added.

Liquid Glue—New Formula.—The following is recommended in "Pharm. Rundschau "(Prag, Dec. 1886, 1021): Sugar, 1 part, is dissolved in 3 parts of water, to this solution is added one-fourth as much slaked lime as sugar used, and the whole heated to 75° C. The mixture is frequently agitated for several days, or until the greater portion of the lime is dissolved. The thick solution is then poured off. If three parts of ground glue are allowed to swell in 13 parts of the sugar solution and then warmed, the glue soon liquefies and remains liquid without impairing its adhesiveness. A thicker or thinner consistency is obtained by adding more or less glue to the sugar solution. Concentrated liquid glue remains turbid, thin solutions become clear on standing. The adhesive properties of this liquid glue are excellent.

Shoe Blacking—Preparation of an Impervious Article.—The following formula is given in "Pharm. Zeitschr. f. Russl." (xxv., 792): Wax, 10; spermaceti, 6; oil of turpentine, 66; asphalt varnish, 5; pulverized borax, 1; nitrobenzol, 1; grape-vine charcoal, 5; Berlin blue, 2. Melt the wax, add the borax, and stir until a jelly is formed. In another vessel melt the spermaceti, add the asphalt varnish, previously mixed with the turpentine, stir well, and add to the wax; lastly add the coloring previously mixed with a small quantity of the mass, perfume with nitrobenzol, and fill in boxes. Apply a small quantity with a rag and brush. To be used only once a week.

Bronzing Metals—Application of the Sulphides of Arsenic and Antimony.—According to "Metallarbeiter" very handsome colors may be imparted to metals by the use of cold solutions of the sulphides of arsenic or antimony. The articles being thoroughly cleaned and dry, a thin layer of a dilute solution of polysulphide of ammonium is applied with a soft brush, and after brushing off the separated sulphur, a dilute ammoniacal solution of sulphide of arsenic or of antimony is applied; the former producing a coating resembling mosaic gold, and becoming deeper and ultimately dark brown by repeated application, whilst the latter produces a rose-tint, which may be deepened to dark red. The coating in either case acquires a bright metallic lustre by polishing, and the colors may be altered by the use of mordants.

MATERIA MEDICA.

A. Vegetable Drugs.

GENERAL SUBJECTS.

Materia Medica—Notes on Various Subjects.—Mr. Ferdinand Lascar contributes some very interesting notes on Materia Medica. The paper is not suited for abstraction, and may be consulted in Drugg. Circ., April 1887, 76.

Worm-Eaten Drugs.—Prof. Otto A. Wall communicates some timely remarks in answer to the question "Should worm-eaten drugs be used for making pharmaceutical preparations?" He answers very decidedly that, while the use of worm-eaten drugs may be admissible for the preparation of well-defined chemical constituents of the drug, as for instance the resin of jalap from worm-eaten jalap, the preparation of galenical products from such, in the case of jalap, for instance of the abstract, the tincture or fluid extract, is not admissible. When drugs become worm-eaten, they should be thrown away, unless, indeed, they may be utilized for the manufacture of some isolated principles by processes which preclude the possibility of the presence of the extractive matter of the insects and their excrements in the finished product.—West. Drugg., April 1887, 105–106.

Pressed Herbs—Quality as Now Found in the Market.—Mr. Joseph Feil has examined the following pressed herbs coming from different purveyors: Boneset, catnip, hoarhound, pennyroyal, peppermint, and sage. His conclusions are: (1) The pressed herbs of the market are true to name. (2) The general quality of those sent out by reliable houses is good. (3) It is possible to get almost ideal goods. (4) Goods without the name of a well known firm should be rejected. (5) Pressed herbs can be better preserved in stock than loose herbs.—West. Drugg., June 1887, 183–184; from Proc. Ohio Pharm., Assoc., 1887.

Three Isolated Alabamian Plants.—Prof. Charles Mohr draws attention to three isolated plants, *Rhus Cotinoides*, Nuttall, *Neviusia Alabamensis*, Gray, and *Croton Alabamense*, Chapman, which are now found only in certain restricted localities in Alabama. These plants must be regarded as such, as while approaching their extinction, maintain a stability of physiological character which disables them to resist the influence of the change in their surroundings, so that eventually they succumb without having been in the least changed from the original tpye. The plants are referred to under their individual headings.

ALGÆ.

Laminaria—Determination of Iodine.—Prof. F. A. Flückiger communicates a method for determining the presence of iodine in very small quantities of laminaria, as small a quantity as 1 decigram sufficing for the experiment. The laminaria in powder is mixed with 1 or 2 parts of pumice, subjected to torrefaction over a gas or spirit flame, and the roasted mixture is then extracted with water, 5 cc. sufficing for 1 decigram of the laminaria. Incineration to ash must be avoided, torrefaction to complete carbonization being sufficient. To determine the iodine a small drop solution of ferric chloride is added to the filtrate, shaken by itself and then shaken in the bisulphide of carbon, which assumes a handsome violet color in the presence of iodine, though often not before several moments. Sufficient ferric chloride must be used to give an acid reaction. A portion of the filtrate may be reserved and the iodine liberated from it by chlorine water; but the least excess of the latter obscures the violet color in the bisulphide of carbon, or in greater excess totally prevents it.—Arch. d. Pharm., June 1887, 519–522.

FUNGI.

Saccharomyces Niger—Occurrence.—Mr. G. Marpmann has observed and examined a black form of "saccharomyces," which appears hitherto to have escaped notice. He first noticed the fungus in the course of some milk examinations, and with care managed to propagate and cultivate the same, though, notwithstanding diligent search, he has not succeeded in finding any further specimens. He believes that this fungus is produced spontaneously on fruits and vegetables, and is introduced into the milk accidentally.—Arch. d. Pharm., Aug. 1886, 705–710.

Ergot—Active Constituents.—Kobert, in contiuation of his previous experiments (see Proceedings 1885, 102–103), has arrived at results which confirm him in the conclusion that Bonjean's extract, Wernich's dialyzed ergotin, extract of ergot (Pharm. Germ.), as well as the sclerotic acid of Podrvyssotzki and Dragendorff, mainly contain ergotinic acid, and that this acid does not possess the action of the ergot itself. The author also finds the ergotinine of ergot to be perfectly worthless, and claims that the activity of fresh ergot is due to two substanes, isolated and described by him (loc. cit.), viz., sphacelinic acid and cornutin. He had previously prepared an extract containing these two principles, and now finds that they lose their activity by keeping under ordinary conditions. He therefore proposes the conversion of the extract, as soon as made from the fresh drug, into pills, and that these be provided with an impermeable coating. He, moreover, finds that ergot itself, as well as all of its preparations, are liable to the same change, and in the course of time become worthless. The author has also experimented with

Corn (Maize) Ergot, Ustilago Maydis, and finds that it, as well as all of its preparations that he has tried, are entirely valueless as substitutes for ergot.—Arch. d. Pharm., July 1886, 597; Pharm. Zeitg , 31, 323.

Ergot—Characters of the Powder When Freed From Oil.—Mr. Holdermann recommends for the detection of the fixed oil, of which the powder is supposed to have been deprived, to place a few grams upon white paper so as to form a small cone, to press this cone on the apex, and to pour on the powder sufficient ether to thoroughly moisten. On the evaporation of the ether any remaining fixed oil in the powder will be evidenced by a grease stain left on the paper. Powdered ergot which has been deprived of its fixed oil by ether, will retain a certain amount of water derived from the ether, though appearing dusty dry. It is necessary, therefore, to subject the powder to thorough drying after such treatment, else it is liable to become musty. The character of the fixed oil extracted by ether enables the determination of the age of the ergot. The oil from fresh ergot is tolerably light colored, and at first perfectly fluid; that obtained from old ergot is dark colored and has the consistence of butter when the ether has completely evaporated. Another point indicative of fresh ergot is that the infusion has a characteristic violet color.—Arch. d. Pharm., Feb., 1887, 131; from Süd-Deutsche Apoth. Zeitg.

Ergot.—Trimethylamine formed from *Choline*, naturally present, which see under "Organic Bases."

Ustilago Maydis—Proximate Constituents.—Messrs. C. J. Rademaker and J.L. Fischer have subjected *Ustilago maydis* to proximate examination with the following results:

	Petroleum spirit extract, per cent.
Fixed oil	6.50
Resin	8.00
Wax	5.50
Chlorophyll	trace.

	Ether extract, per cent.
Trimethylamine	1.50
Sclerotic or mæsenic acid	2.00
Wax	6.25
Resin	4.50
Chlorophyll	trace.
	Alcohol extract.
Sclerotic acid	0.50
Resin	3.50
Chlorophyll	trace.
	Aqueous extract.
Sugar	3.75
Pectin	2.25
Salts	4.00
Extractive	9.50

Besides these they have separated an alkaloid, for which they propose the name

Ustilagine.—The salts of this alkaloid are crystallizable, the acetate crystallizing in long slender needles. The alkaloid is white, and has a bitter taste. It is soluble in ether, alcohol, and water. Its salts are also soluble in water, and they are precipitated by the double iodide of mercury and potassium. When treated with concentrated sulphuric acid, the alkaloid dissolves the solution, assuming a maroon discoloration, which gradually fades into an intense green, and with a solution of perchloride of iron a deep yellow color is produced. The

Sclerotic acid crystallizes in needles. It is soluble in water, alcohol, and ether. It decomposes the alkaline carbonates, and its salts are crystallizable.—Nat. Drugg., June 17, 1887, 296; from "Medical Herald."

Polyporus Officinalis—Proximate Examination.—Mr. J. Schmieder has subjected white agaric to proximate examination, with results that may be briefly given as follows: The fungus contains 5.76 per cent. of ash, composed of potassium, sodium, iron lime, magnesia and silica, in combination with phosphoric, sulphuric and carbonic acid, and chlorine. The total percentage of nitrogen was 0.910 to 0.917 per cent. By distilling the fungus with milk of lime, *methylamine* was obtained.

Petroleum Ether Extracts:

a. A *soft resin*—$C_{16}H_{20}O_4$.

b. A *liquid fat*, depositing a crystalline body in cooling, and containing:

(1) *Agaricol*—$C_{10}H_{15}OH$, which when heated with P_2S_5 yielded $C_{10}H_{15}SH$ and $(C_{10}H_{16})_2S$. By oxidation with nitric acid it yielded oxalic acid.

(2) *Cholesterin*—$C_{16}H_{14}O,H_2O$.
(3) *Cetyl alcohol*—$C_{16}H_{33},OH$.
(4) *A solid hydrocarbon*—$C_{29}H_{54}$.
(5) *A solid hydrocarbon*—$C_{22}H_{46}$.
(6) *A liquid aromatic alcohol*—$C_9H_{18}O$.
(7) *A resin-like body*—$C_{11}H_{18}O$.
(8) *A fatty-acid* of the composition $C_{14}H_{24}O_2$.

(9) *A fatty acid* isomeric with *ricinolic acid* and possibly identical, $C_{18}H_{34}O_3$, forming salts of the formula $(C_{18}H_{33}O_3)$ 2 Mg. and $C_{18}H_{33}O_3$ Ag.

Watery Extract:

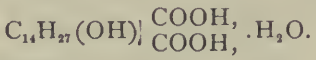
(1) *Glucose.*
(2) *Oxalate of iron.*
(3) *Succinic acid.*
(4) *Phosphoric acid.*
(5) *Malic acid.*
(6) *Tannic acid.*

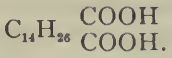
Hydrochloric acid extract:

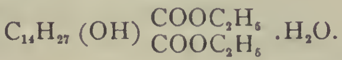
A crystalline acid, forming twin crystals, was obtained in insufficient quantity for nearer examination.

Alcoholic Extract:

(1) *α-Resin*, composed of a dark resin $(C_{15}H_{24}O_4)$ and a light resin $(C_{17}H_{28}O_3)$.

(2) *β-Resin*, (agaric acid) 
$C_{14}H_{27}(OH)\begin{matrix}COOH,\\COOH,\end{matrix}.H_2O$.

anhydrid, 
$C_{14}H_{26}\begin{matrix}COOH\\COOH.\end{matrix}$

ether, 
$C_{14}H_{27}(OH)\begin{matrix}COOC_2H_5\\COOC_2H_5\end{matrix}.H_2O$.

acetyl compound, 
$C_{14}H_{27}(OCH_3CO)\begin{matrix}COOH\\COOH.\end{matrix}$

(3) *γ-Resin*, $C_{14}H_{22}O_3$, yielding by splitting up a sublimate body, $C_{14}H_{20}O_2$.

(4) *δ-Resin* (acid), $C_{12}H_{22}O_4$.

Alkaline Extract:

A nitrogenized body, most probably an albuminoid.

Residue, Cellulose.—Arch. der Pharm., Aug. 1886, 641–668.

FILICES.

Male Fern—Variation in Activity According to Place of Growth.—Dr. Béranger-Feraud has made the interesting observation that the rhizomes of male fern grown in Normandy possessed very little activity, while rhizomes grown in the Jura or Vosges mountains invariably proved active.—Arch. d. Pharm., Dec., 1886, 1034; from Jour. de Pharm. et de Chim., 1886, xiv, 321.

EQUISETACEÆ.

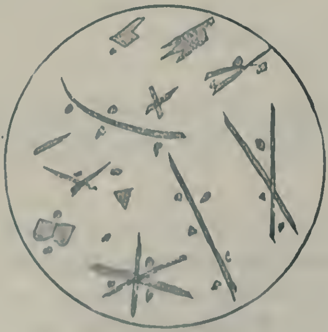
Equisetum Hyemale, Lin.—*Proximate Examination.*—Mr. Frank J. Young has subjected this plant, which has some reputation in dropsical affections, to proximate examination. The air-dry drug yielded 18.2 per cent. of ash, consisting mostly of silica. Petroleum benzin exhausted from the powder 1.4 per cent., of a brownish-green semi-liquid fixed oil, which was readily saponified and was solüble in ether, chloroform and carbon bisulphide. Ether now took up 5.33 per cent. of a green semi-solid resin, soluble in chloroform, benzol and absolute alcohol, and imparting to water or acidulated water a greenish color, but no decided taste. Alcohol dissolved from the residuary powder 1.60 per cent. of resinous extract, free from tannin, alkaloid and glucoside. The powder gave to water 4.84 per cent. of extract, of which 2.25 per cent. were shown to be sugar by Fehling's solution, and 0.60 per cent. of mucilaginous matter was left undissolved by alcohol of 66 per cent.—Amer. Jour. Pharm., Sept., 1886, 419–420.

GRAMINACEÆ.

Wheat-germs—Composition.—In a preliminary communication Messrs. Cl. Richardson and C. A. Crampton state that they have obtained from wheat-germs a rapidly drying oil; 15 to 18 per cent. of sugar—principally cane sugar; allantoin, heretofore only found once as a plant constituent, a waxy body, not saponifiable, and several albuminoids.—Arch. d. Pharm., July 1886, 631; from Ber. d. D. Chem. Ges., xix., 1180.

Stigmata Maydis—Proximate Analysis.—Dr. C. J. Rademaker and Mr. John L. Fischer have determined the presence of *maizenic acid*, so-called by Dr. Vautier, who first described it, to be present in the dried corn silk to the extent of about 2.25 per cent. Its appearance under a microscope of 700 diameters is shown in the accompanying cut: It is

FIG. 10.



Maizenic Acid.

freely soluble in water, in alcohol, and in ether, but insoluble in petroleum spirit. It decomposes the alkaline carbonates, and forms crystallizable salts, the potassium salt forming rhomboidal prisms. The authors sum up the results of their analysis as follows:

Fixed oil	5.25	petroleum spirit extract.
Resin, crystalline principle and chlorophyll.	2.25	ether extract.
Resin, crystalline principle and chlorophyll.	3.25	alcohol extract.
Sugar, gum and extractive	19.50	water extract.
Albuminoids, phlobaphene, etc.	3.50	alkaline extract.
Salts and extractive	5.50	acid extract.
Cellulose	37.00	
Water	20.00	
	96.25	

The fixed oil is light yellow, easily saponifiable with caustic potash, and solidifies at 50° F. Volatile oil was not found.—Amer. Jour. Pharm., Aug. 1886, 369–370.

Coix Lachryma—Uses of the Fruits.—Mr. G. M. Beringer observes that the fruits of this graminacea, popularly known by the name of Job's tears, are being again called for occasionally by fond mothers for the purpose of making into necklaces, under the impression that children wearing such ornaments will cut their teeth more easily. The peculiarity of this grass is the formation of the pistillate spikelet being one to two flowered, inclosed within a bract which becomes a round bony shining involucre.—Amer. Jour. Pharm., June 1887, 286.

Millet Seed—Characters of Fixed Oil, etc.—While most of the seeds of cereals contain but a small percentage of fixed oil, as calculated for the entire seed, the quantity in the integumentary portion is comparatively high. Thus for the bran of millet Mr. G. Kassner obtained 18.64, 18.8, and in one instance 25 per cent. of a peculiar fixed oil, by extraction with ether, which oil he has subjected to nearer examination. It was light yellow, had a pleasant odor, but the taste, while at first mild, soon produced an acid impression in the throat. It is soluble in alcohol of 96 per cent. in all proportions. Upon the addition of water, two layers are formed, the lower retaining a small portion of alcohol, but composed almost completely of the bland, neutral portion of the oil, whilst the upper alcoholic solution reacted strongly acid, and held a portion of oil in solution which possessed strong drying properties. Further experiments proved the acid constituents to possess properties and a composition closely conforming to that of linoleic acid. A crystalline body was also observed to separate from the oil shortly after its preparation, and this separation continued for some time. It is but sparingly soluble in ether, insoluble in alcohol and water, but soluble in chloroform, bisulphide of carbon, and in benzol. The new compound, which requires further examination, has the composition corresponding to the formula $C_{13}H_{20}O$.—Arch. d. Pharm., May 1887, 395–402.

PALMACEÆ.

Cocoanut—Estimation of Sucrose, Glucose and Starch.—Mr. D. L. Haigh, endeavoring to estimate sucrose, glucose, and starch in cocoanut, met with some difficulties, which were overcome as follows: The sucrose was converted into glucose and the two estimated together; then the glucose was estimated by itself. Then a weighed sample of the cocoanut was placed in an extraction apparatus and extracted with ether. This dissolved out all the oil present. The substance was then dried and extracted with methyl alcohol (any other alcohol would probably answer as well). This dissolved the cane sugar and glucose, and the starch remaining in the percolator was then converted and estimated as glucose. This method gave very good results, and is very little trouble to work.—Drugg. Circ., Jan. 1887, 4.

MELANTHACEÆ.

Veratrum Viride—Distinction from V. Album.—Prof. Jos. Schrenk observes that no characters are given by either European or American pharmacognocists, by which the rhizome of *Veratrum viride* might be distinguished from that of the European *V. album.* The only difference that he could find was that the walls of the endodermis cells in *V. album* were much more thickened than in *V. viride*, and that in the root the lumen left by the thickening had, in the cross sections, the form of a U in *V. viride*, and of a V in *V. album.* Many samples of the drug sold as *V. viride* that have come under the author's notice were *very much lighter* than those of the European species; they were not compact and hard, but of a decidedly loose and spongy structure, this distinction of the two drugs being easily recognized. Most likely, these light root-stocks had not been gathered at the proper time; it remains to be learned whether (as seems probable) they are of inferior quality, and ought to be rejected. —Amer. Drugg., Jan. 1887, 2.

Veratrum Album.—Chelidonic acid identical with its acid constituent, *Jervic Acid*, which see under "Organic Chemistry."

SMILACEÆ.

Smilax Rotundifolia, Lin.—*Proximate Examination of the Rhizome.* —Mr. Arthur H. Cohn has collected the rhizome of Smilax rotundifolia for investigation, and describes it as creeping, pale yellow, many feet long, about ¼ inch thick, with internodes 4 to 6 inches in length, the nodes considerably thickened, and each marked by a prominent brownish triangular leaf scale, and beset with some fine light colored rootlets; the rootlets are more numerous near the growing end, and are of a brown color. The dried rhizome is brittle, has little or no odor, and has a somewhat bitter and slightly acrid taste. He obtained from the air-dry powder 2.3 per cent. of ash, and by treatment with benzin .05 per cent. of wax; with ether .5 per cent. of resin, and with alcohol 2.8 per cent. of extract, the latter probably containing a glucoside, as indicated by the reactions. More of this principle was shown to be in the aqueous infusion, but it was not isolated. The presence of gummy matter, sugar, pectin, starch, etc., was ascertained; also the absence of calcium oxalate.—Amer. Jour. Pharm., Sept. 1886, 419.

LILIACEÆ.

Squill—Examination of the Commercial Powder.—Mr. G. Steinmann has examined seven samples of powdered squill. The ash amounted from No. 1 to 3.30 per cent.; No. 2, to 8.20 per cent.; No. 3, to 2.70 per cent.; No. 4, to 3.95 per cent.; No. 5, to 3.65 per cent.; No. 6, to 3.30 per cent.; No. 7, to 4.00 per cent. No. 1 was known to be pure, therefore was free from starch or any other substance that might be added on the pretext of assisting the grinding or preventing "caking" of the powder. Although this specimen has been kept since January, there is no sign of the "caking" sometimes complained of; the only precaution has been to keep it in a well-corked bottle. The ash of No. 2 consisted largely of calcium sulphate, which points to an admixture of about 5 per cent. of gypsum, added, no doubt, to prevent the "caking" as well as to cheapen. No. 3 contained starch, and Nos. 4, 5, and 6 were probably pure—a difference in amount of moisture would account for the variation in ash. No. 7 contained starch, and probably some other impurity, or the ash would have been less from the presence of starch, instead of higher than the average.—Amer. Jour. Pharm., June 1887, 279–280.

IRIDEACEÆ.

Iris Pseud-Acorus—Isolation and character of a new carbohydrate—*Irisin*, which see under "Organic Chemistry."

Saffron—Adulteration, etc.—Dr. Niederstadt has observed saffron adulterated with foreign floral organs and with meat fibres. A sample of the finest quality of French saffron contained 14 per cent. of moisture and 5.84 per cent. of ash, of which 1.546 per cent. (=0.058 per cent. of the saffron) was sodium chloride. Four samples of Spanish saffron obtained from Barcelona as pure contained

Moisture	16.70	15.80	19.80	17.60	per cent.
Ash	10.30 (incl. 1.546 NaCl)	14.65	13.80	14.90	"

Glycerin, which has also been used for increasing the weight, renders the saffron sticky and adhesive to blotting paper. An adulteration with honey is difficult to prove, since saffron contains about 15.30 per cent.

of sugar, Dr. Niederstadt having found 13 per cent. On agitating adulterated saffron repeatedly with water, fine needle-shaped fragments of red saunders are separated and may be readily identified from the structure under the microscope. Inferior saffron will give with strong sulphuric acid only a slight blue color, in proportion to the amount of pure saffron present.—Arch. de Pharm., Jan. 1887, 73–74.

Messrs. Cazeneuve and Linossier direct attention to the fraudulent sale of exhausted saffron dyed with various artificial coloring matters, some of which are difficult to detect, while others yield with water a red or orange red infusion, which after acidulation with tartaric acid, is a red dye for wool.—Jour. de Pharm. et de Chim., 1886; Amer. Jour. Pharm., March 1887, 155.

Saffron—Detection of Sandalwood.—According to Mr. J. Herz, the presence of sandalwood in saffron is detected under the microscope by the colors produced by soda solution or hydrochloric acid. 0.5 mg. sandalwood in 10 cc. alcohol of 50 per cent. gives a distinct violet-red color on addition of a few drops of soda solution, while the extraction from 5 mg. in 10 cc. alcohol becomes dark brown red. Under the same conditions the extraction from 5 mg. of pure saffron is not changed, whilst that of 5 mg. of sandalwood and 5 mg. of saffron gives a yellow-brown color. The author found sandalwood to yield 1.14 per cent. ash.—Arch. de Pharm., August 1886, 713; from Rep. Anal. Chem., 86, 384.

Saffron.—An interesting paper on the saffron plant, and in connection with the town of Saffron Walden (England), has been communicated by Mr. Joseph Clark to the "Essex Naturalist" (Jan. 1887), and is reprinted in Pharm. Jour. and Trans., June 1887, 1032–1034. The paper is of particular interest as a contribution to the history of the drug.

AMOMEACEÆ.

Cardamoms—Commercial Quality of the Powder.—Mr. J. Herz has examined commercial samples of powdered cardamoms, and compares his results with those obtained with cardamoms which are composed of 62.35 p. seeds and 37.65 p. hulls. The results were as follows:

	Ash.	Insoluble in HCl.
1. Commercial powder	10.379	2.19
2. "	14.146	4.66
3. Seeds	9.660	3.49
4. Hulls	13.414	2.43

—Arch. d. Pharm., Aug. 1886, 712; from Rep. d. Anal. Chem., 86, 384.

Arrowroot—Manufacture in St. Vincent.—Mr. J. W. Macdonald has read a highly interesting paper on the manufacture of arrowroot starch in St. Vincent, before the Liverpool Section of the Society of Industry.

The paper enters into the minutest details of the process of manufacture, and considers also the method of cultivation, the commerce, the chemical composition, as well as the adulteration of the starch, and the economical uses of the by-products of its manufacture. It will be consulted with profit in Pharm. Jour. and Trans., June 18, 1887, 1042–1044.

ORCHIDACEÆ.

Orchis Laxiflora, L., and *O. Latifolia*, L.—*Occurrence in Afghanistan.*—Mr. J. E. T. Aitchison obtained these two species of orchis in a few localities in the Badghis, the Harirúd Valley, and Khorasán. Near Meshad he came across people digging for the tubers of these orchids, which they called "sálab" and "sálap." The author's inquiries lead him to the conclusion that the tubers generally exported from Meshad into India through Afghanistan are those of the above species.—Pharm. Jour. and Trans., Dec. 11, 1886, 467.

HYDROCHARDACEÆ.

Anacharis Canadensis, Planchon (*A. Alsinastrum*, Bab.)—*Anti-malarial Effect of its Cultivation.*—The cultivation of this plant is declared by Mr. Brandes to have caused the disappearance of malaria and diarrhœa in a marshy district where these diseases formerly appeared yearly in a sporadic or epidemic form. Whether the recommendation to plant this waterweed in marshy localities, with the view of checking malaria, is likely to be followed by the desired success, may probably be more readily ascertained in malarial districts of North America. The plant being quite common in ditches, ponds and slow streams, it should be ascertained whether it is absent from such districts.—Amer. Jour. Pharm., Dec. 1886, 616; from Med. News, Aug. 28, 1886.

ARISTOLOCHIACEÆ.

Serpentaria—Correction of the Pharmacopœial Description.—Prof. Jos. Schrenk observes that the morphological description of *Aristolochia Serpentaria*, L., contained in our Pharmacopœia, needs some modification. The rhizome is evidently a sympodium which consists of a number of joints, each being the result of a season's growth. At the end of every joint grows the stem, which bears leaves and flowers. It falls off after having performed its functions, and leaves a small scar, so that there are no stem remnants. It is, therefore, not correct to say: "The rhizome . . . on the upper side with approximate, short stem remnants." The author suggests the following description: "The rhizome . . . consisting of several short, curved joints, each with a scar at its upper projecting end."—Amer. Drugg., April 1887, 61.

PIPERACEÆ.

Pepper—Methods of Examination.—Mr. H. Röttger has contributed a monograph on the examination of pepper, embracing the results of comprehensive experiments made to determine its purity.—Arch. f. Hygiene, 86, 163–228.

Factitious Pepper—Examination, etc.—Mr. N. Wender describes a factitious pepper which has made its appearance in the Austrian market, and is manufactured in Buda-Pest. It resembles a ribbed pill, and he states that it is sold at about two-fifths of the wholesale price of Singapore pepper, and that it has been used for adulterating unground pepper to the extent of 75 per cent. Examined by Dr. Hanausek, this artificial product was found to be manufactured of wheat flour, most likely mixed with alcoholic extract of pepper (the oleo-resinous by-products left in preparing piperine? *Editor*), and colored with a black pigment, lamp-black; it was free from capsicum.—Zeitschr. Oest. Apoth. Ver., 1887, 147.

Matta—An Adulterant of Pepper, etc.—Dr. J. Möller draws attention to a new adulterant for pepper and other spices, which is designated in wholesale drug lists as "matta," and appears to be prepared from the cortical portions of a variety of millet (*Setaria germanica*). It constitutes a powder varying in color according to the use to which it is to be applied, being ash-gray for pepper, cinnamon-brown for cinnamon, and chocolate-brown for pimenta. The adulterant is easily detected by the microscope, which reveals the characteristic epidermal cells of seeds from graminaceous plants.—Arch. d. Pharm., Aug. 1886, 714; from Chemiker Ztg., 86, 133.

Poivrette—A New Pepper Adulterant.—Prof. J. Campbell Brown draws attention to a substance, known in trade under the names of "poivrette" and "pepperette," which is now frequently used for the purpose of adulterating pepper. It is a pale, slightly buff, or cream-colored powder, resembling in the bulk the principal middle layers of the pepper-berry, when ground; and when mixed with pepper cannot be distinguished by the eye, nor even by the hand lens, from particles of pepper. In the earlier samples the coarser particles could be isolated by spreading the pepper on a stiff sheet of paper held in a nearly, but not quite horizontal position; on tapping this with the finger tips, so as to make the larger particles jump gradually to the lower edge of the sheet, the poivrette particles could then be picked out, and easily distinguished from pepper by crushing them between the teeth. Recently, however, it has been so finely ground and sifted that it cannot always be partly separated in this way, although the toughness and hardness of the particles can always be distinguished by the teeth in a mixture.

The author's inquiries respecting the source of this article clearly established that it was manufactured at Leghorn, and that, as might be supposed, the manufacturer keeps its composition secret. He therefore examined a number of substances that being waste products in Italy were likely to enter its composition, and amongst them walnut-shells, almond-shells, and olive-stones. The cells of walnut-shells are dotted, though otherwise similar to poivrette; the almond-shells greatly resemble poivrette, and olive-stones still more closely resemble it. Chemical analysis indicates the closest correspondence between poivrette and olive-stones, as the following figures show:

	Ash.	Matters soluble by boiling in dil. acid.	Albuminous and other matters soluble in alkali.	Woody fiber, insoluble in acid and alkali.	Starch.
White pepperette	1.33	38.32	14.08	48.48	None.
Black pepperette	2.47	34.55	17.66	47.69	"
Ground almond-shells	2.05	23.53	24.79	51.68	"
Ground olive stones	1.61	39.08	15.04	45.38	"

The stones of olives, imported in pickle for table use, gave 3.68 per cent. of ash; but well washed olive-stones, thoroughly burnt to a white ash, gave under two per cent. of ash like poivrette. "White poivrette" is therefore cleaned very pale, and perhaps partly bleached olive stones, or precisely similar tissue; black poivrette is the same, mixed with a little black husk. The author also gave some of the micro-chemical characters of the substance.—"The Analyst," Feb. 1887, 23.

Daphnidium Cubeba—Chemical Examination of the Fruits.—Messrs. J. Oldham Braithwaite and E. H. Farr have subjected the fruits of *Daphnidium Cubeba* to chemical examination, with the results below given. These fruits were introduced on the London drug market, apparently under the idea that they were genuine cubebs, but were identified by Mr. E. M. Holmes to be botanically quite distinct, and to be derived from the above named plant. In form they are not unlike the officinal drug. They are almost spherical, of a dull reddish brown color, and have a marked pleasant odor, with a bitter aromatic taste, they are superior, one-celled, berry-like fruit, easily detached from the persistent calyx and its accompanying short stalk. The pericarp is rugose, soft and oily, the testa very hard and shell-like. The embryo is very oily. A microscopic examination of a transverse section of the integuments of the fruit shows further differences from that of *Piper Cubeba*. In *daphnidium*, the testa is composed of a layer of extremely hard, elongated cells, placed with their extremities towards the axis, and having an interrupted layer of sclerenchymatous cells on the exterior, with a softer layer of tabular cells next to the embryo. The pericarp is very oily. In *Piper Cubeba* these elongated cells are not found, the testa being composed solely of hexagonal sclerenchymatous tissue. The results of the chemical examination lead the authors to the following preliminary statement of the constituents of the fruit:

Petroleum Ether Extract, 24.2 per cent.
  Comprising volatile oil, 1.25 per cent. Non-volatile fats, consisting of lauric, cupric and oleic acids, 23.95 per cent.

Ether Extract, 11.5 per cent.
  Comprising three resins separable by solvents, two alkaloidal bodies—one precipitable by lead acetate, the other not—and traces of glucosidal resin.

Alcohol Extract, 3.5 per cent.
  Comprising faint traces of an alkaloid, a glucosidal resin, and two neutral resins.

Aqueous Extract, 5.8 per cent.
  Consisting chiefly of extractives with some mucilage, containing an alkaloid or glucosidal matter, and free from sugar.

The moisture was estimated to be equal to 5.34 per cent. The ash amounted to 5.998 per cent.—Yearbook of Pharm., 1886, 463–471.

LAURACEÆ.

Ceylon Cinnamon—Proximate Analysis.—Prof. Henry Trimble reports the following analysis of three samples of Ceylon cinnamon by Mr. Jas. A. Ferguson: Ash in No. 1, 4.00 per cent.; No. 2, 4.00 per cent.; No. 3, 5.00 per cent. 10 grams of No. 1 were exhausted with petroleum spirit in a continuous extraction apparatus, and yielded .75 per cent. of a yellowish oleo-resin, which became crystalline and was almost completely soluble in 95 per cent. alcohol. That insoluble in petroleum spirit was exhausted in the same manner with stronger ether, by which 1.20 per cent. of a reddish-brown extract was obtained. This had in a marked degree the odor and taste of the original drug, thus showing that petroleum spirit will not exhaust all the odorous principle from this bark. Absolute alcohol extracted 14.70 per cent. of a reddish-brown mixture composed of resin, tannin and coloring matter.

The same gentleman estimated the ash in four samples of powdered

Cassia Cinnamon.—He obtained in No. 1, 2.8 per cent.; No. 2, 2.5 per cent.; No. 3, 4.6 per cent.; No. 4, 5.00 per cent.

In both of the above series No. 1 was undoubtedly pure, and may be aken as a standard. In the first series No. 2 was also probably pure, while No. 3 was, no doubt, adulterated. The cassia sample No. 2 was probably pure, while Nos. 3 and 4 were undoubtedly adulterated; such samples would be worthy of further critical examination.—Amer. Jour. Pharm., June 1887, 278–279.

MYRISTICACEÆ.

Mace—Commercial Quality of the Powder.—Messrs. R. Frühling and J. Schulz make some interesting communications respecting the examination of commercial samples of powdered mace. Of 36 samples sold as "pure powdered mace" 24 were adulterated, the remaining 12 being seemingly pure. The adulterants consisted of powdered nutmeg, ground crackers, starch from grains and leguminous seeds, arrowroot, turmeric, dextrin, as well as the powder of the wild mace—the so called "Bombay mace." After numerous experiments the authors determined two preliminary methods of testing; the one depending on the absence of starch in pure genuine mace, the second on the absence of a certain coloring matter soluble in alcohol. For the first test 2.5 grams of the powder are heated to boiling with 20 cc. of water, cooled, and filtered. In the case of pure mace the filtrate passes rapidly, and is not blued by iodine solution. The presence of starch, crackers, etc., is evidenced by the pasty condition of the mass on the filter, the difficulty of filtration, and the blue color produced in the filtrate by iodine. If dextrin is present, this is evidenced by the odor during boiling. The second test is made by macerating 2.5 gm. of the powder in 10 cc. absolute alcohol, agitating a few minutes, and filtering. Genuine mace yields a colored filtrate, but this color is not communicated to filter paper, whilst in the presence of turmeric or "Bombay mace" the paper becomes yellow. This yellow color changes in the case of turmeric, as is well known, to brown, on contact with solution of potassa, whilst in the presence of "Bombay mace" the paper is turned blood-red. Special methods are given for the determination of nutmeg, which is recognized under the microscope by the character of its peculiar starch.—Arch. de Pharm., Aug. 1886, 713.

POLYGONACEÆ.

Rheum—Afghan Species.—Mr. J. E. T. Aitchison found a very handsome species of rhubarb on the great plains in the Harirúd valley, at an elevation of nearly 2000 feet. It is a species nearly related to *R. songaricum*, Schrenk, and is very peculiar in its growth, producing three enormous basal leaves, which spread out flat on the ground, each being about 4 feet long by 5 across, and the flowering stem, with a loose spreading panicle of flowers, reaches a height of about 3 feet. The fruit, which is large and winged, ripening to a ruby red, is collected and employed as a purgative, and when not procurable the root is substituted.—Pharm. Jour. and Trans., Dec. 11, 1886, 467.

PLANTAGINACEÆ.

Plantago Major, Lin.—*Proximnte Examination of Leaves.*—Theo. Koller, in 1868, obtained from the leaves of *Plantago major*, *P. lanceolata* and *P. media*, chlorophyll, resin, wax, albumin, pectin, citric acid, and oxalic acid. Mr. David Rosenbaum has now examined the leaves of *P. major*, with the following results: Petroleum benzin extracted 4 per cent. of wax and chlorophyll, the extract fusing at 83° C. Ether dissolved 4.4 per cent. of resin and chlorophyll. The alcohol extract weighed 10 per cent., 6 per cent. being soluble in water, this portion containing considerable sugar; the remaining 4 parts were dissolved by ammonia. The soluble matter taken up by water weighed 13 per cent., 7.2 of which was insoluble in 66 per cent. alcohol. Soda solution dissolved 6 per cent., and diluted acid 10 per cent., the latter containing a notable quantity of calcium oxalate. The bleached lignin weighed 35.5 per cent. The powdered leaves contained 8 per cent. of moisture and yielded 12.85 per cent. of ash, 2.85 of which was soluble in water, and 9.50 soluble in hydrochloric acid. Tannin, saponin, alkaloid, etc., were not found.—Amer. Jour. Pharm., Sept. 1886, 418.

SCROPHULARIACEÆ.

Leptandra Virginica, Nuttall—*Proximate Examination.*—To obtain the bitter principle, Mr. Gust. Steinmann poured the concentrated tincture into water, and agitated the acidulated aqueous solution with petroleum benzin, benzol and chloroform; only the benzol liquid yielded a residue which was crystalline. 500 gm. of the drug yielded only 0.5 gm. of the crystals, which after recrystallizing from ether, were of a pale lemon-yellow color, of a peculiar agreeable odor, and of a very bitter taste. They were found to be insoluble in petroleum benzin, soluble in alcohol, ether and benzol, less freely soluble in cold water, not precipitated by Mayer's solution or by tannin, and not yielding glucose on being boiled with dilute sulphuric acid. The resinous matter precipitated by water from the alcoholic extract, loses the bitter taste almost completely by repeated solution and precipitation.—Amer. Jour. Pharm., May 1887, 229.

SOLANACEÆ.

Potatoes.—Formation, after being bruised and long keeping, of *Solanine*, which see under "Organic Bases."

Belladonna Root—Pharmacognostic Characters.—It is stated by authorities that the bast-cells are entirely absent in belladonna root. Prof. Jos. Schrenk now observes that he has found bast-cells, in a few specimens, in close proximity to the cribrose tissue, either singly or in pairs. Their walls are thickened in the manner of most bast-cells, and canals are sparingly seen in them. The author had to remove the amylum and to stain the sections before he could detect the cells. Their number is exceedingly small, which might account for their having been overlooked.—Amer. Drugg., Jan. 1887, 2.

Tabacum—Presence of a Peculiar Form of Hairs on the Young Leaf.—

While examining a small young leaf of tobacco Prof. Joseph Schrenk observed a very peculiar form of hairs, which, to his knowledge, have not yet been described. At first inclined to believe that these hairs occurred on young leaves only, and hence had hitherto escaped detection, he soon found that these curious hairs are found on old leaves also. It requires, however, considerable patience to hunt them up, and in some cases he did not find any. They are much longer than ordinary hairs, on old leaves sometimes more than twice as long (.12 mm. and longer). The large, much inflated basal cell of such a hair rests on a number of cells raised slightly above the level of the epidermis. The other cells are much narrower; some of them have lateral extensions. In each hair one or two of these extensions develop into several celled branches, which have at their end either a glandular head, or a simple cell tapering to a point. The end of the axis is always occupied by a several celled gland. The glands have the same contents as those on unbranched hairs, viz., some yellowish oil and calcium oxalate crystals. The original paper is accompanied by cuts showing the microscopic structure of these peculiar hairs. —Amer. Drugg., April 1887, 61–62.

OLEACEÆ.

Olea fragrans, Thunberg, and *Forsythia suspensa*, Vahl.—*Glucosidal Constituent.*—These two Japanese oleaceæ, according to Prof. J. F. Eykman, contain a new glucoside, $C_{26}H_{32}O_{11}$, which crystallizes in colorless silky needles, is insoluble in ether and petroleum, and sparingly soluble in cold water, from which solution it is not precipitated by lead and other mineral salts. By oxidation with chromic acid it yields a compound having the odor of vanillin, and by boiling with acids it is decomposed into glucose and a substance of phenolic properties, the latter being readily soluble in alcohol and ether, sparingly soluble in water, and insoluble in petroleum benzin.

In its physical properties the new glucoside resembles *phillyrin*, $C_{27}H_{34}O_{11}$, the composition and properties of which were investigated by Bertagnini in 1860, but which had been used by Carboncini since 1825 as a febrifuge. The latter had at first regarded it as an alkaloid; in 1836 he published the process by which he obtained it from the bark of the South-European species of Phillyrea. This process consists essentially in preparing a decoction, adding lime, exhausting the sediment with alcohol, decolorizing and crystallizing.—Amer. Jour. Pharm., May 1887, 265.

Olive stones, probaby the source of the new adulterant for pepper known in commerce by the name of *Poivrette*, which see under "Piperaceæ."

Fraxinus Americana, Lin.—*Proximate Examination.*—Mr. George W. J. Hoffman has experimented to isolate the alkaloid which Mr.

Howard M. Edwards believed to have evidence of in the bark of the American white ash in 1882 (see Proceedings 1882, p. 168). He records a number of experiments, but failed utterly to obtain evidence of the presence of an alkaloid in that bark.

Mr. Daniel W. Cahill made experiments in the same direction, with somewhat different results. He succeeded in isolating a quantity of a crystalline substance which is probably *fraxetin.* An alkaloid could not be isolated, but solutions were obtained which gave alkaloidal precipitates. His experiments were made with both the root bark and trunk bark, a systematic course of analysis by Dragendorff's plan giving the following results:

	Root Bark.	*Trunk Bark.*
Organic matter extracted by petroleum benzin	.60	.20
" " strong ether	.36	.36
" " absolute alcohol	14.68	11.00
" " water	10.33	9.14
" " dilute alkali	.89	.83
" " dilute acid	4.20	2.16
Loss by leaching	3.26	2.91
Moisture	6.76	7.23
Ash	5.92	5.40
Residue	45.95	56.09
Loss	7.05	4.68
	100.00	100.00

—Amer. Jour. Pharm., Aug. 1886, 370–373.

Manna—Afghan Varieties.—Mr. J. E. T. Aitchison describes several varieties of manna which have come under his observation while in Afghanistan in 1885. The first variety, and that which is most largely exported, is an exudation that occurs in certain seasons and years upon

Cotoneaster Nummularia, Fisch. et Mey.—a tall, stout shrub, met with throughout the Paropamisus range and in Khorasán, at an altitude of about 5,000 feet. During July the smaller branches of this shrub become covered with the exudation, and this is collected by merely shaking the branches over a cloth. It is eaten largely by the people as a sweetmeat, and exported in quantity to Russia and India. The second variety is yielded by the camel-thorn,

Alhagi Camelorum, Fisch.—a small shrub, growing generally over the country at an altitude of 2,000 feet, and very frequently forming a dense scrub. The manna is developed in certain years during the month of July on the branches. The country round Rui-Khauf, in Persia, is celebrated for this product, which is thence exported in all directions. A third kind of manna is that yielded by

Tamarix Gallica, Lin., var., *Mannifera.*—The author also collected a quantity of manna in the form of milk drops from the foliage of

Salsola Fœtida, Dec.—It was pleasant to the taste, with a slightly aromatic flavor.—Pharm. Jour. and Trans., Dec. 11, 1886, 467.

LABIATÆ.

Peppermint—Influence of Drying and Prolonged Exposure of the Plant on the Volatile Oil.—Mr. Albert M. Todd communicates the results of some highly interesting experiments made to determine the influence of drying the peppermint plant upon the volatile oil distilled from it. Besides noting the remarkable fact that the distillation of oil can be effected with *threefold the rapidity* from the dry than from the green plants, his experiments and experience lead him to the following conclusions:

1. No loss of essential oil of peppermint through diffusion in the atmosphere is occasioned by thorough drying of the plants and prolonged exposure to the atmospheric action prior to distillation.

2. Such exposure does not increase the crystallizing tendency of the essential oil.

3. A heavy and insoluble resinoid is produced by oxidation, increasing the sp. gr. of the oil, and theoretically affecting the boiling point and solubility by raising the former and decreasing the latter.

4. To obtain the best results as to quality of oil produced, and the facility of handling and distillation, the plants should be dried as thoroughly as possible without endangering the loss of leaves and blossoms; distillation should then take place as soon as convenient to prevent the formation of resin.—Amer. Drugg., Sept. 1886, 161.

Orthosiphon Stamineus, Bentham.—*Proximate Constituents.*—The dried leaves of this plant, also known as

Oeymum Grandiflorum, Blume, and which is a native of India, Java, and the Nicobar and Philippine Islands, have been examined by Dr. Van Itallie, who obtained a small quantity of volatile oil and of a crystalline glucoside. This orthosiphonin has a bitter and afterward sweet taste, is freely soluble in absolute alcohol, less soluble in weak alcohol and in chloroform, almost insoluble in absolute ether, and is precipitated by plumbic subacetate, but not by the acetate or by tannin. It does not contain nitrogen.—Pharm. Ztg., 1886, 376.

Orthosiphon Stamineus—Medicinal Use of the Leaves.—According to Perinelle, the small, oval, finely-serrated leaves of this plant, indigenous to South America and the East Indies, are treated in these countries similarly to tea leaves, dried, and successfully employed in form of infusion in the treatment of kidney and bladder troubles, not alone by the natives, but also by the European physicians residing there.—Arch. d. Pharm., May 1887, 415; from Jour. de Pharm. et de Chim., 1887, xv. 275.

BORRAGINACEÆ.

Yerba Santa—Constituents.—Mr. R. Rother communicates the results of some experiments made to determine the character of the principle to which the property of disguising the taste of quinine is due. He finds this to be in all probability an acidic anhydride, which is remarkably soluble in ammonia, but soluble also in other alkalies and their carbonates. It is best extracted from the eriodictyon leaves by dilute ammonia, but is associated with a large amount of inert matter, which is readily separated by evaporating and treating the residue with alcohol, which dissolves the ammonia compound. On the basis of these observations the author has constructed a formula for the preparation of fluid extract. —(See under Pharmacy), Amer. Jour. Pharm., May 1887, 225–227.

CONVOLVULACEÆ.

Powdered Jalap—Percentage of Resin.—Mr. G. H. Chas. Klie has recently examined powdered jalap, which contained the large amount of 12.17 per cent. of resin. Just before this he had examined a sample which contained the smallest amount he ever observed, viz., 5.52 per cent. of resin. In former experiments he had obtained 10.28, 9.9, and 6.6 per cent. from different samples at different periods.—Nat. Drugg., April 1, 1887, 156.

BIGNONIACEÆ.

Gelsemium Root—Occurrence and Separation of a Second Alkaloid.—Mr. F. A. Thompson communicates the results of his studies upon the alkaloids of *Gelsemium sempervirens*, which are particularly interesting from the fact that he has succeeded in separating a second alkaloid, for which he proposes the name

Gelseminine.—By suitable treatment the author obtains the two alkaloids—gelsemine and gelseminine—in solution as sulphates, from which they are precipitated by alkali and shaken out with ether. The ethereal solution is shaken with water acidulated with hydrochloric acid, whereby the two alkaloids are converted into hydrochlorates or muriates, that of *gelseminine* being readily soluble, whilst the hydrochlorate of the older alkaloid, *gelsemine*, is deposited out on standing and is obtained pure by several crystallizations. The author describes gelsemine and its muriate and nitrate, both of which are crystalline; the sulphate was not obtained in crystalline form, and has not been studied. The new alkaloid, gelseminine, differs greatly as to its physical and chemical properties from gelsemine. Not having been able to obtain this alkaloid in form of a crystallized salt, he is not certain that he has obtained it pure. He gives some of its reactions, but the whole subject evidently requires further study.—Pharm. Era, Jan. 1887, 3–7.

Gelsemium Elegans, Benth.—*Occurrence and Uses in China.*—Messrs.

Charles Ford and W. E. Crow communicate some highly interesting notes on "Chinese Materia Medica," the same comprising the results of comprehensive study. In their first paper they describe *Gelsemium elegans*, Benth., a plant which has not been alluded to in any previous contribution to Chinese materia medica. After a description of the plant and its habitat, the authors state that the root is the only part of the plant used in medicine. As met with in the native drug shops in Hong Kong, under the name "Hu muan chiang," it consists of thick pieces of the underground stem, with or without portions of the *true root* and rootlets attached. A piece of the *root* in the possession of the authors exhibits the following characters: Cortical layer thick, easily removed from central woody portion, externally of a brown color, wrinkled, marked at intervals of from half to one inch by transverse cracks, extending about half-way round and as far as the meditullium. A section of the latter shows the medullary rays stretching through the yellow woody portion in a manner similar to that displayed by the root of *G. nitidum* (*G. sempervirens*). When cut with a sharp knife, the central woody part shows a waxy section. The most interesting chemical constituent of the drug, as determined in the Government laboratory, is an alkaloid belonging to the group of strychnine or tetanus-producing alkaloids. Its most characteristic reaction is the production of a deep violet coloration when in contact with oxidizing agents, but the end reaction remains deep purple, whereas in the case of strychnine the end reaction consists in the assumption of a cherry-red tint under the same circumstances. The new alkaloid is not associated with gelseminic acid, and, unlike gelsemine and strychnine, it will not bear the action of sulphuric acid at a temperature of 100° C. From the experience of Dr. C. J. Wharry, the drug differs in its physiological action from *G. sempervirens*, and more nearly resembles that of *strychnos nux vomica.*—Pharm. Jour. and Trans., May 14, 1887, 924–927.

Catalpa Bignonioides, Walter—*Proximate Examination of the Seeds.*—Mr. Fred. K. Brown has subjected the seeds of *Catalpa Bignonioides*, Walter, to proximate examination. He demonstrated the presence of resin, fixed oil, tannin, and sugar, and on distilling with water, obtained a distillate having somewhat of a rancid odor. Two crystalline bodies were obtained by treating the powdered seeds with a mixture of ether, alcohol, and ammonia, acidulating the concentrated filtrate, removing oil and other impurities with ether, neutralizing with ammonia, and agitating with a mixture of ether and chloroform; on evaporating the ethereal solution, needles were left, which were soluble in alcohol, ether, and chloroform, insoluble in water, almost tasteless, and after boiling with dilute sulphuric acid did not reduce Fehling's solution. The aqueous liquid left after treatment with ether and chloroform, yielded crystals, which must have contained ammonia sulphate, and possibly also a glucoside, since after boiling with sulphuric acid, a reaction with Fehling's solution was obtained.—Amer. Jour. Pharm., May 1887, 230.

GENTIANACEÆ.

False Chiretta—Admixture with True Chiretta.—Mr. William Elborne draws attention to some false chiretta, bundles of which were found along with bundles of true chiretta, in a parcel of the drug purchased in London, to the extent of at least 30 per cent. A portion of this false chiretta was identical with the false chiretta described by Prof. Bentley, namely, *Ophelia angustifolia*, Grisebach; the remainder, however, presented a marked difference, inasmuch as it contained a well-developed pith, similar to the officinal drug, although from its want of bitterness it was evidently spurious. The British Museum authorities, to whom Mr. Elborne submitted the sample for identification, have referred it to *Ophelia alata*, Grisebach.—Pharm. Jour. and Trans., May 7, 1887, 903.

APOCYNACEÆ.

Asclepias and Vincetoxicum—Presence of a Glucoside—Asclepiadin, which see under "Organic Chemistry."

Nux Vomica—Examination of Commercial Samples of Different Galenical Preparations.—Mr. N. H. Martin read a very interesting paper before the Br. Pharm. Conference, 1886, in which he points out, as a result of his experiments, the difficulty attending the standardizing the galenical preparations of nux vomica, as attempted by the recent revision of the B. P. (1885). He examined twenty-five samples of the tincture, eleven of which were evidently prepared from the drug direct, whilst the remaining fourteen samples gave evidence of having been prepared by the method directed by the B. P. Nine of the tinctures prepared from the drug direct had specific gravities ranging from .8365 to .855, dry extract from .56 to 1.31 per cent. and total alkaloids of .119 to .285 per cent. The other two samples were evidently prepared with a dilute spirit of about the strength required by the new Pharmacopœia. The specific gravities of the fourteen samples, presumably prepared according to the Pharmacopœia, ranged from .8804 to .8965, dry extract from .96 to 1.34 per cent., and total alkaloids from .196 to .313 per cent. Four samples of the dry extract were examined. The first contained 16.3 per cent. of total alkaloids, but 15.2 per cent. of moisture on drying, and regained 16.3 per cent. of moisture when exposed to the air. In the other three samples the amount of total alkaloids found was 15.0, 16.6, and 16.8 per cent.; the amount of moisture lost was 8.9, 12 7, and 10 per cent., and the amount of moisture again absorbed was 12.0, 14.0, and 16.8 per cent. respectively. It becomes evident from these results that a chemist having assayed his extract correctly in the morning, on being called upon in the evening of the same day to dispense it, may be guilty of using a preparation of either greater or less potency than the Pharmacopœia standard. The author's results are given in tabular statements, which may be consulted in Year-book of Pharm., 1886, 507–512.

Strophanthus—Commercial Characters, etc.—Mr. H. Helbing states that strophanthus is now easily to be had of good and uniform quality. It is offered in two forms, either in pods or seeds, and there exists also a difference in the seeds, the more common kinds, which the author designates as "Kombé strophanthus seed," and a second kind, which he designates as "white seed." The

Kombé strophanthus seeds are 1½ to 2½ centimeters long, and 4 to 5 millimeters broad. They are more or less rounded off at the base, without, however, losing the distinctly pointed shape; towards the upper end they become suddenly very much narrower, and end in the stalk of the pappus. They are flattened at the sides, and have a much more prominent keel-shaped ridge on one side than on the other; the seed is twisted slightly in the form of a spiral from the base to the apex. The color of the seeds varies from greyish-green to brown, being more or less covered with numerous appressed silvery hairs of silky appearance. The

White strophanthus seed is similar in form to the Kombé seed, only the seeds are more densely covered with looser, longer, silky hairs, like a fur, so that the real shape of the seed is not quite so apparent as in the Kombé seed. The color of the hairs of these seeds is much paler than that of the Kombé, and is almost white. The

Strophanthus pods now found in commerce are in no respect different in appearance from those formerly offered. The quality of the pods is, however, not always the same. Five similar pods from a large stock were examined by the author with the following results:

Pod.	Weight of Single Pod.	Weight of Pod Lining.	Weight of Hairs.	Weight of Seeds.	Percentage of Seeds in Pods.	Number of Seeds.
I. . .	216 grs.	89 grs.	77 grs.	50 grs.	23.15	303
II. . .	334 "	142 "	86 "	106 "	31.76	294
III. . .	188 "	65 "	44 "	79 "	42.04	201
IV. . .	132 "	49 "	25 "	58 "	43.93	126
V. . .	289 "	91 "	58 "	140 "	48.44	203
Total .	1159 grs.	436 grs.	290 grs.	433 grs.	. . . . . .	1127

As sum total, the pods contain: Seeds, 37.36; pod-lining, 37.61; hairs, 25.02. These percentages correspond very closely with those obtained by previous examination. The author has made some experiments respecting the tincture, which lead him to recommend:

I. That the tincture be prepared with rectified spirit.

II. That the fatty oil be previously removed by ether.

III. That the proportion of the seeds to the tincture is as 1 to 20.

In selecting the drug the author recommends that clean seeds be given the preference. As to the difference between Kombé and white seeds, the preparations from the latter appear to be as strong as those from the former.—Pharm. Jour. and Trans., March 12, 1887, 747–750.

Strophanthus—Proximate Examination of the Seeds.—Mr. William Elborne, after giving a botanical description of

Strophanthus Kombé—the particular species that is said to yield the seeds that have recently been introduced into medicine—and after reviewing the chemistry and the pharmacological action of the drug, communicates the results of the proximate analysis of the seeds, of which the following is a résumé:

I. Petroleum ether extracted fixed oil		20.8 p. c.
II. Ether extracted chlorophyll and fat		.9 p. c.
III. Absolute alcohol extracted bitter glucoside	1.5	4.4 p. c.
IV. Water extracted bitter glucoside	2.9	
Albuminous matter		19.6 p. c.
Insoluble residue		54.3 p. c.

Respecting the

Tincture of Strophanthus, the author observes that rectified spirit, by the revised process of Dr. Frazer (see under Tinctura), extracts only about 7 p. c. of extractive of an albuminous nature, but it leaves about 1.5 p. c. of the bitter principle, which even an increased quantity of menstruum fails to extract. Complete extraction of the bitter principle could readily be effected by lowering the strength of the menstruum; but then an objectionably large amount of albuminuos matter would also be extracted. The author's experiments upon the common hairs, the endocarp, and the root, prove them to contain very little of the glucoside. The trunk, on the other hand, seems to possess some activity, though inferior to the seed. —Pharm. Jour. and Trans., March 12, 1887, 743 to 747.

Strophanthus Seeds—Amount of Extractive by Different Solvents.—Mr. A. W. Gerrard communicates the results of some experiments made to determine the amount of extract obtainable from strophanthus seeds by different solvents. His results are in the main confirmatory of those of Helbing. By drying the fine meal at 140°, it lost 5.5 per cent.; 100 fluidounces of light petroleum ether extracted from 10 oz. of the crushed seeds, 31 per cent. of green fixed oil, and the residual meal, after completely drying to remove the ether, yielded to 100 fluidounces of 84 per cent. alcohol 5.2 per cent. of extract. In a second experiment, petroleum ether, ether and *absolute* alcohol were used consecutively in the same way, the yield of alcoholic extract being finally 5 per cent. Furthermore, the author finds that by using boiling alcohol, it is quite practicable to make an *alcoholic extract* directly from the seeds, without first extracting the oil. The boiling alcohol extracts the oil, along with the extract. On distilling off the alcohol, the oil may be perfectly decanted from the extract. Finally the author has prepared and describes *strophanthin*, which see under "Organic Chemistry."—Pharm. Jour. and Trans., May 14, 1887, 923.

Strophanthus—Activity of the Ether-Extract.—Mr. H. D. Rolleston's experiments seem to indicate that the oily matter extracted by ether from the seeds, as recommended by Dr. Frazer to be done before preparing the tincture from them, possesses a certain amount of activity, due to strophanthin. The ethereal extracts of the pericarp and hairs were also found to be active, though not to such an extent as the ethereal extract of the seeds.—Pharm. Jour. and Trans., March 19, 1887, 761.

False Strophanthus Seed—Occurrence and Identification.—Mr. E. M. Holmes describes some seeds offered as strophanthus seeds, and, at first, doubtfully referred to *Holarrhena africana*. Having received some additional supplies, among which were perfect seeds, he had no difficulty to determine the spurious drug to be derived from a species of *Kicksia*, doubtless *K. africana*.—Pharm. Jour. and Trans., May 7, 1887, 903–904.

Strophanthus—Review of Dr. Frazer's and Other Papers, etc.—The "Amer. Drugg." (August, 1886, 144–145) reviews the characters of "strophanthus" as given by different observers, and reproduces a portion of Dr. Frazer's original paper on the subject. The reviewer also gives a description of a follicle and seeds of *Strophanthus hispidus* (accompanied by an illustration showing their character and comparative size), which is as follows: "The closed strophanthus follicle was 13 inches long. It is not round, but somewhat flattened along its whole extent. Viewed from the front, the broadest portion is about 1 inch from the base, where it measures ¾ inch across. Viewed from the side, the broadest part is situated higher up, about 1¾ inches from the base, and here the diameter is $\frac{9}{16}$ inch. From either point the follicle tapers gradually towards both ends, ending in a fine point at the top. The follicle is slightly curved, the ventral suture being, as usual, on the convex side. The shell of the follicle is thin and fragile. Externally it is dull yellowish-brown, and finely-grooved lengthwise. The interior surface is shining, bright pale yellow or yellowish brown. The seeds contained within the follicle are comose, the stalk of the tuft being about 2 inches long, while the hairs themselves have a length of 1½ to 2 inches. The seeds are irregularly oval and flattened, of a glossy, brownish color, and of a velvety appearance, due to fine, appressed hairs. They are about 10 mm. (⅜ inch) long, 4 mm. broad across the center, and, at the thickest portion, about 2 mm. thick, tapering to 1 mm. at either end. The base or radicle end of the seed is blunt; at the other end it tapers to a fine, slightly curved point, from which the stalk of the coma arises. The surface of the seed is irregular, an elevated central ridge running from one end to the other.

Physostigma—Character and Examination of the Commercial Drug.—Mr. P. Macewan states that the cylindric seed noticed by Mr. Holmes among commercial calabar bean in 1879, does not appear to have occurred in the market since that time. The commercial drug varies in color between violet-black and coffee-brown, the former being the fully ripe seeds, and the latter probably immature. For assaying the seed it is best ground in a mill. The two varieties were found to contain 7.2 per cent. of moisture; the black yielded 3.1, and the brown seed 3.4 per cent. of ash. Petroleum ether extracted from the brown 0.2, and from the black 1.068 per cent. of a golden yellow thick oil, containing crystals of physosterin. Ether now extracted 0.36 per cent. of a yellow oil of agreeable odor, and containing a granular substance apparently different from physosterin. For estimating the alkaloid, the volumetric process, with Mayer's solution, failed to give reliable results, but the gravimetric method was more satisfactory. The author recommends the following process: Exhaust the powdered bean, by digestion and percolation, with a mixture of alcohol 3 parts and water 1 part, evaporate the spirit, precipitate with lead acetate, remove excess of lead from the filtrate, render alkaline by ammonium carbonate, and dissolve the alkaloid with chloroform. The alkaloidal residue should be of a pale amber color, and wholly soluble in dilute acid. Thus obtained the alkaloid was found to be soluble in ether, and its iodohydrargyrate to be quite soluble in alcohol; for these reasons the author is inclined to doubt the existence in calabar bean, of calabarine, announced by Harnack and Witkowski.—Pharm. Jour. and Trans., Feb. 5, 1887, 641.

Gymnea Sylvestre, R. Br.—*Proximate Examination of the Leaves.*—Mr. David Hooper has subjected the leaves of *Gymnea Sylvestre* to proximate analysis. The plant is found in the Decan peninsula, is met with in Assam and on the Coromandel coast, and is distributed in the African continent. It is a stout woody climber, with long slender branches, leaves opposite, entire, from 1½ to 3 inches long and from 1 to 2 inches broad, elliptic or obovate, acute, rounded or pointed, rarely cordate at the base, thinly coriaceous, both surfaces shortly pubscent or puberulous, the upper darker than the lower surface. The root has a reputation as a remedy for snake-bite; but the most curious property is that attributed to the leaves, which are said when chewed to destroy the power of the tongue to appreciate the taste of sugar. The result of the author's analysis of the sun-dried leaves are as follows:

Ether Extract (chlorophyll and resin)	5.51
Alcohol Extract (gymnemic acid, tartaric acid, glocose, neutral bitter principle, etc.)	19.50
Aqueous Extract (gum (1.45 per cent.) glucose, carbohydrate and extractive)	16.87
Alkaline Extract, by difference (albuminous and coloring matter)	8.15

Acid Solution (calcium oxalate 7.64, pararabin 2.74)	10.38
Ash (balance of)	5.69
Cellulose	27.86
Moisture	6.04

—Pharm. Jour. and Trans., April 23, 1887, 867–868.

SAPOTACEÆ.

Vegetable Fats—Description of certain Sapotaceous Plants of Sumatra yielding them.—Dr. Burck has given descriptions of a number of sapotaceous plants yielding vegetable fats in Sumatra and Borneo, etc., which he reproduces in a communication to Pharm. Jour. and Trans. (May 7, 1887, 902–903). The majority of the plants described are new species, and are the following:

Palaquium Pisang, Burck.—This yields the fat called "Balam."

Palaquium Oleosum, Burck.—The fat of this species is distinguished by the name "Soentei" fat. The *Balam fat* is of a yellowish color, and has a slightly bitter taste; it is pliable as wax. It is used for a variety of purposes. The *soentei fat* is of a pure white color, has a sweetish taste, and is used by the natives for cooking purposes.

Palaquium Oblongifolium, Burck.—The fat of this tree is prized in the Sambas province more than any other fat for cooking purposes. It is prepared almost exclusively for home use, and is consequently not quoted in the Singapore trade reports.

Payena Lancifolia, Burck.—The fat which is fluid at the ordinary temperature, is called by the natives "Kelakki" fat. It is not esteemed as highly as some other vegetable fats for kitchen purposes.

Payena (?) *Multilineata*, Burck.—The fat of this tree, which is doubtfully referred to the genus *Payena*, is inferior, and is used only for lighting purposes. The native name of the tree is "Belaban" or "Melaban."

Payena Bankensis, Burck.—The fat of this tree is at the usual temperature in Java a thick fluid, is said to agree in purity and color with almond oil, and is known in different localities as "Tangkawang Sangai" or "Ketianu" oil.

Payena Latifolia, Burck.—The oil obtained from the fruit of this tree is said to be clear, yellow, pleasant to the taste, and has the odor of bitter almonds. It is perfectly solid at 4°.

Payena Macrophylla, Burck.—The oil of the seeds is used for various purposes.

Diploknema Sebifera, Pierre.—The fat from the Miryak Tangkawang of Bandjermassing. Mr. Holmes expresses the opinion that of all the above Sapotacea the Balam and Soentei trees of the east coast of Sumatra seem the most worthy of attention as objects of culture, more especially as the fats have already found uses in European industries.

EBENACEÆ.

Tangkawang Fat—Determination of Botanical Source.—In a former paper (see Proceedings 1884, 144–145) Mr. E. M. Holmes called attention to and described a new vegetable fat from Singapore, which is known in the Dutch East Indies under the name of Tangkawang, the trees yielding the fat being known under the name of *Minyak Tangkawang* or *Minyak Sangkawang.* Mr. Holmes has now received from Mr. Burck, Assistant Director of the Botanical Gardens at Buitenzog, botanical specimens of the different species of the plants that yield this fat, together with a description of their diagnostic characters, which he now reproduces in his paper. Six of these plants are species of

Shorea, viz.: *S. Stenoptera*, Burck; *S. Gysbertsiana*, Burck; *S. Aptera*, Burck; *S. Scaberrima*, Burck; *S. Martiniana*, Burck; *S. Pinanga*, Scheffer. The seventh plant yielding this fat is *Isoptera Borneensis*, Scheffer. Mr. Holmes, in addition to the description of the diagnostic character of the plant, as given by Dr. Burck, adds some descriptions of his own relating particularly to the characters of the fruit from which the fat is obtained.—See Pharm. Jour. and Trans., May 1, 1887, 901–902.

STYRACEÆ.

Storax—Purification.—Mr. E. Mylius finds that the purification of storax is most successful by the use of petroleum ether. By this agent the pitch-like, inert storesin is separated, and the depurated storax becomes a tolerably thin liquid, containing all the active constituents, and mixing readily with oils and fats.—Arch. d. Pharm., Dec. 1886, 1025; from Pharm. Centralh., 1886, 27, 515 et seq.

Benzoin—Occurrence of Caoutchouc in a Sample.—Mr. Charles Schmidt, after making some concentrated tincture from Sumatra benzoin, noticed a whitish substance running through the dregs in fine veins. On examination this proved to be elastic, and, resembling caoutchouc, it was forwarded to Prof. Power, of the University of Wisconsin, who determined it to be really such. A second sample of Sumatra benzoin, from another lot, however, was examined by the author, but no caoutchouc, or substance resembling it, was found. The author infers that the caoutchouc in the first specimen was an accidental impurity.—Amer. Jour. Pharm., July 1886, 331.

ERICACEÆ.

Gaultheria Procumbens—Proximate Analysis of the Leaves.—Mr. Frank W. Droelle has made a proximate analysis of the finely ground wintergreen leaves, after they had been separated from the stems, with the following results:

Volatile oil	.50	per cent.
Resin and wax	2.50	"
Resin soluble in ether	2.15	"
Chlorophyll, with small amounts of arbutin, urson and tannin	2.75	"
Tannin	5.45	"
Chlorophyll, arbutin and ericolin	3.80	"
Mucilage	2.90	"
Glucose and dextrin	3.56	"
Organic acids	3.25	"
Albuminoids	4.54	"
Pararabin and allied substances	2.20	"
Loss by treatment with chlorine	6.35	"
Moisture	8.60	"
Ash	4.20	"
Lignin and cellulose	45.53	"
Total	98.18	

Both the ethereal and alcoholic extracts were tested for alkaloids with negative results. Starch and calcium oxalate were also shown to be absent.—Amer. Jour. Pharm., June 1887, 289–290.

Chimaphila Umbellata—Separation of two Crystalline Principles from the Leaves.—Mr. E. S. Beshore extracted from the leaves of *chimaphila umbellata* by treatment with petroleum spirit a crystalline compound, which when purified by suitable means had a composition corresponding very closely to the formula $C_{10}H_{19}O$. The crystals melt at 236° C. (difference from urson, which melts at 190° C.); they can be sublimed at a temperature below the melting point if the heat is applied long enough, and they finally carbonize at 278° C. They are sparingly soluble in cold or boiling 90 per cent. alcohol, sparingly soluble in absolute alcohol, stronger ether, benzol, chloroform, and glacial acetic acid, and precipitated on diluting with water; more freely soluble in hot glacial acetic acid. Bromine has a decided action on them, and appears to form bromine derivatives. When pure they do not give any color reaction with nitric acid (difference from urson), but slowly dissolve in the acid. Strong sulphuric acid does not carbonize them, nor is the acid colored, which will serve as a chemical test by which they may be distinguished from urson, the latter being carbonized by strong sulphuric acid, and the acid colored red. Like urson, they are tasteless and odorless, when pure. They are not well crystallized from stronger ether. The most perfect crystallization may probably be obtained from a solution in chloroform. By distillation of the leaves, practically free from stems, the author obtained some crystals, the occurrence of which was first mentioned by Mr. Samuel Fairbank in 1860. These crystals appear to be distinct from the one obtained by the action on the drug with petroleum spirit, in the following respects: 1st. In their physical properties, the crystals being of yellow and flaky appearance and freely soluble in most simple solvents; on the other hand, those obtained by the action on the drug with petroleum spirit are purely white, and the crystals have an acicular appearance. 2d. In the chemical behavior they differ by forming color reactions with sulphuric acid, with sulphuric acid and bichromate of potassium, and with sulphuric followed by nitric acid. Those obtained by the action on the drug with petroleum spirit do not produce any color reaction with the above reagents.—Amer. Jour. Pharm., March 1887, 125–126.

Vaccinium Macrocarpon, Lin.—*Occurrence of a Distinct Bitter Principle.*—In a former paper (see Proceedings 1886,) Mr. Edo Claassen had announced the existence of arbutin in the cowberry (*Vaccinium Vitis Idæa*, Lin.), and at the same time expressed the supposition that the bitterness of the fruit of the American cranberry (*V. macrocarpon*, Lin.) might contain the same principle, though his experiments then made failed to determine its presence. He has since made comprehensive experiments, both with the dried plant and the fruits of the American cranberry, and failed to obtain a crystalline bitter principle. He finds, however, that all parts of the plant contain a very bitter uncrystallizable principle, which possesses distinctive characters, for which he proposes the name

Oxycoccin.—It represents a yellowish-brown extract-like mass, which yields when dried a very hygroscopic powder of lighter brown color. The new principle is easily dissolved by water and by alcohol, very sparingly in ether and in chloroform. On combustion it leaves a slight amount of ash, containing sodium and potassium. In its conduct towards reagents it resembles arbutin to some extent, and particularly in that it produces a blue color with phosphomolybdic acid and ammonia, a reaction hitherto regarded as characteristic of arbutin. It is glucosidal in its character. Incidentally, also, the author obtained the calcium salt of an acid in the form of beautiful four or mostly six-sided plates, on the identity of which with kinate of calcium he is now experimenting.—Amer. Jour. Pharm., July 1886, 321–325.

Kalmia angustifolia, Lin.—*Proximate Examination of the Leaves.*—Mr. T. I. Deibert found the fresh leaves of this shrub to lose 64 per cent. on drying, and the air-dried leaves at an elevated temperature 10 per cent. They yielded to boiling water a substance resembling and probably identical with arbutin. The benzin extract contained wax, resin and fixed oil; it did not give a blue color with ammonia and phosphomolybdic acid. The leaves, previously treated with benzin, gave an alcoholic tincture containing considerable tannin, and subsequently yielded an infusion in which gummy matters were present. The air-dry leaves yielded 3½ per cent. of ash.—Amer. Jour. Pharm., Sept. 1886, 417–418.

LOBELIACEÆ.

Lobelia inflata, L.—*Proximate Constituents.*—Messrs. J. U. and C. G. Lloyd review the characters and chemical history of the herb and seeds of Lobelia inflata, and communicate the results of their chemical examination of the seeds. They have prepared the alkaloid

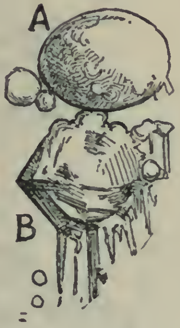
Lobeline in a pure condition, but failed, as did other experimenters, to obtain it in a crystalline condition, but in contradistinction of others obtained it as an amorphous solid. It is colorless, odorless, sparingly soluble in water, readily in alcohol, chloroform, ether, benzol, and bisulphide of carbon, not hygroscopic, and apparently not changed by exposure to the air. Its salts are readily soluble in water, and also in alcohol and in ether, but, with the exception of the acetate, not in bisulphide of carbon to any material extent. The alkaloid and its salts give all of the ordinary alkaloid reactions. It is reddened by sulphuric acid, becomes yellow by nitric acid, and is not colored by hydrochloric acid. On heating the first named acid blackens it, it is decomposed by the second, but remains unchanged by the third. The authors succeeded in isolating from lobelia seed a neutral substance, which they have named

Inflatin.—It pre-exists in the herb as well as the seeds, and is extracted from them by bisulphide of carbon. The new substance was evidently already observed by Procter, but was not separated or identified. It is a crystallizable substance, exhibiting under the microscope the various forms and appearances shown in the accompanying cuts (Figs. 11, 12, 13, 14, 15, 16). Fig. 12 showing a crystal with adherent oil drops; the variations being dependent on the solvent as well as the amount of the substance undergoing crystallization. It is colorless, tasteless and odorless, insoluble in water or glycerin, soluble in bisulphide of carbon (most abundantly), in benzol, in chloroform, in ether, and (least soluble among these) in alcohol. It does not combine with acids or alkalies, and is evi-

FIG. 11.

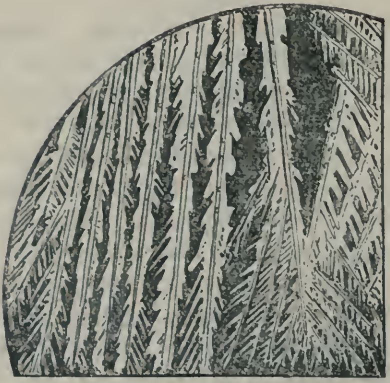
Lobelia Seed, highly magnified.

FIG. 12.



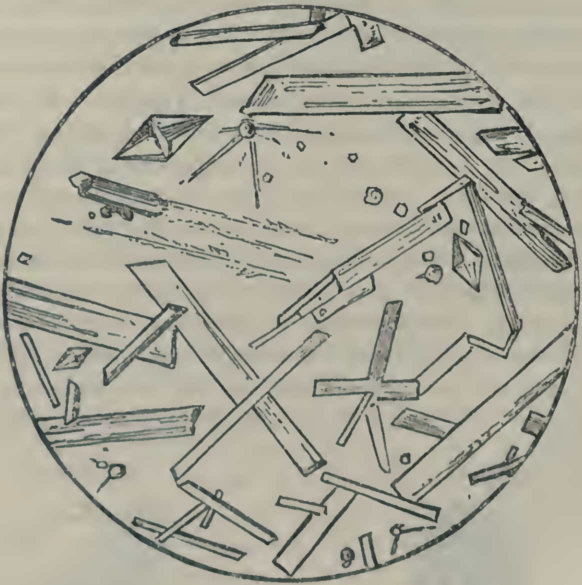
Inflatin Globules—A, ordinary form; B, partly crystallized.

FIG. 13.



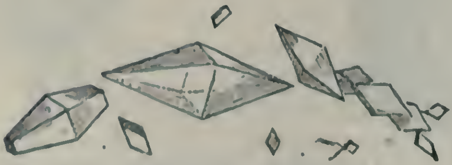
Inflatin from Benzol.

FIG. 14.



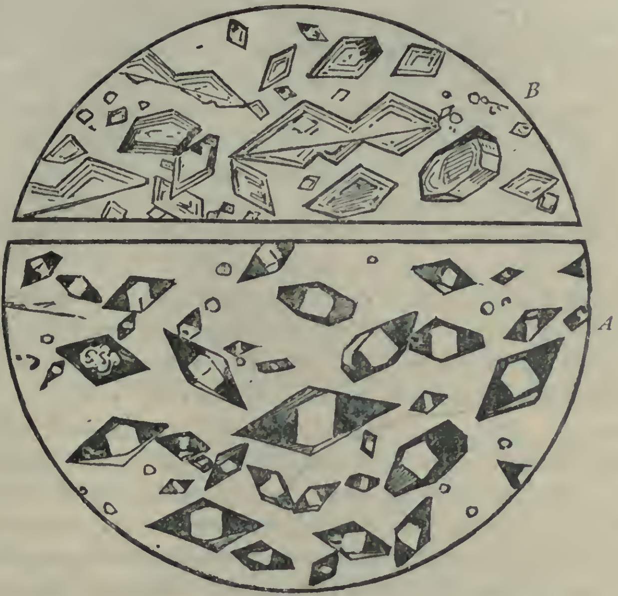
Inflatin from dense solution of Benzol.

FIG. 15.



Inflatin, typical form.

Fig. 16.



Inflatin—*B*, before, and *A*, after action of Nitric Acid.

dently not a glucoside. Cold sulphuric or nitric acid do not decompose it, but the former blackens it when heated. Inflatin melts when heated with nitric acid, but upon evaporation of the acid, the crystals can again be obtained unchanged by solution in benzol. The authors have also separated the volatile and fixed oil.—Pharm. Rundschau, Feb. 1887, 32–35.

Lobelia—Unofficinal Preparation.—Prof. J. U. Lloyd communicates a large number of formulas for unofficinal preparations of lobelia, embracing cataplasms, enema, extract, fluid extract, lotion, liniment, syrups, oxymel, pills, powders, tinctures, etc., etc., for which reference may be had to Pharm. Rec., Jan. 1, 1887, 3–4.

COMPOSITÆ.

Eupatorium Perfoliatum, L.—*Proximate Examination.*—Mr. Oscar F. Dana, Jr., has subjected this plant to proximate examination, his results being as follows: moisture 10.50, extract by petroleum benzin 3.80, by ether, 4.60, by alcohol 33.80, by water 24.80, by alkali 5.80, cellulin 11.70; loss by treatment with chlorine, etc., 5.00. The ash amounted to 8.3 per cent. Crystals were observed in the benzin extract, and were prepared in larger quantity by exhausting the plant with alcohol, treating this extract with ether and the ethereal extract with benzin. Thus obtained the crystals were still impure, and were not further examined.—Amer. Jour. Pharm., May 1887, 229.

Eupatorium Ayapana, Ventenat.—*Characters and Use of the Leaves.*—According to "Phar. Zeitsch. f. Russl." (1886, 707), the leaves are at present met with in European commerce. The dried leaves are about 8 cm. long and 15 mm. (⅔ inch) broad, brown, smooth, oblong-lanceolate, the margin somewhat revolute. Two prominent lateral veins branch off from the midrib near the base, and extend parallel with the margin to the apex. The odor is slight, coumarin-like, and the taste mildly astringent and aromatic. The leaves are recommended against indigestion, pectoral complaints and in cholera, and were used for similar purposes in Europe in the early part of the present century.

The shrub is indigenous to Brazil, but is now found throughout tropical America and in India. L'Heritier and Martius reported also its efficient use in Brazil against snake bites, the leaves being employed externally and internally.—Amer. Jour. Pharm., March 1887, 154.

Taraxacum—Presence of Pith in the Root.—Our authorities state quite positively that taraxacum root contains a central wood-cylinder without any pith. Prof. Jos. Schrenk now states that he has found a distinct pith in a very large number of roots taken from commercial samples of taraxacum. From ten to fifteen fibro-vascular bundles surrounded by parenchyma tissue include the pith, the diameter of which in some instances exceeds the thickness of the woody zone several times. In other respects, the structure of the root was normal, the concentric arrangement of the laticiferous ducts in particular excluding any possibility of mistaking the specimens for chicory, etc.—Amer. Drugg., Jan. 1887, 2.

Lactucarium—Characters of its Prominent Constituents.—Dr. O. Hesse has subjected some of the prominent constituents of lactucarium to nearer examination. *Lactucerin* was prepared by treating German lactucarium with cold petroleum benzin, decanting and evaporating the clear liquid, heating the residue (lactucerin, resin and caoutchouc) in steam and extracting with boiling alcohol, the mother-liquor of which will finally retain the resin with some lactucerin. The crystals of the latter consist of two ethers, *α lactucerol* and *β lactucerol*, which yield with warm, alcoholic potassa, potassium acetate and two alcohols, which after having been washed with water, are separated by boiling with little alcohol. It is a mixture of the two ethers in varying proportion, and its melting point was found to vary between 182° and 207° C. Since, on heating, acetic acid is given off, it is possible that Lenoir's lactucon, obtained in 1846, may mainly consist of lactucerin, which however has not all the properties attributed by Lenoir to his compound.

α Lactucerol (formerly called lactuceryl alcohol) crystallizes in long, silky needles, is sparingly soluble in cold alcohol, acetone and glacial acetic acid, insoluble in water and alkalies, and freely soluble in chloroform, ether and ligroin, from which solvents it crystallizes anhydrous. It melts at 179° C., may be distilled in a current of carbonic acid gas, and has the composition $C_{18}H_{30}O+H_2O$. Its acetether is produced by continued heating with acetic anhydride, crystallizes in small scales, melts at 210° C., and is freely soluble in chloroform, ether, petroleum benzin, and in boiling alcohol and glacial acetic acid.

β–Lactucerol remains in the alcoholic mother liquor of the *a* alcohol, crystallizes with difficulty, and on evaporation is obtained as a gelatinous mass, which on drying forms a white powder; from ether or chloroform it crystallizes readily in long needles of a silvery lustre, and isomeric with the preceding compound.

Dr. Hesse observes that the lactucerols are isomeric with *sycocerol*, the acetether of which was found by Warren de la Rue and Hugo Müller (Annalen, vol. 116, p. 225) in the resin of Ficus rubiginosa, and possibly with *hydrocarotin*, though he regards the latter as being $C_{20}H_{34}O$ and isomeric with cinchol.

The Lactucon, obtained by Franchimont in 1879 from French lactucarium, is by Hesse named

Gallacton.—It is an indifferent compound, having the formula $C_{14}H_{24}O$, melting at 296. Flückiger's lactucon had the composition $C_{19}HgO$, melting at 232° C.—Liebig's Anal., 234, 243.

Tragopogon Porrifolius—Chemical Examination of the Seeds.—Messrs. C. J. Rademaker and John L. Fischer have subjected the seeds of *Tragopogon Porrifolius* to proximate examination, with the following results:

Water	10.00	per cent.	
Fixed oil and chlorophyl	20.00	"	from petroleum spirit.
Resin and crystalline principle	4.00	"	" ether solution.
" " chlorophyl	1.00	"	" chloroform solution.
" " crystalline principle	4.50	"	" alcohol solution.
Crystalline principle and extractive	4.25	"	" aqueous solution.
Albuminoids	3.50	"	" alkaline solution.
Salts and extractive	6.00	"	" dilute acid solution.
Starch	11.50	"	
Cellulose	33.25	"	
	98.00		

Crystalline principle separately determined, 1.75 per cent. from an acid solution by means of ether.

This crystalline principle possesses well-defined acid characters, and the authors propose for it the name of

Tragoponic Acid.—It is soluble in water, in alcohol and in ether, but insoluble in petroleum spirit and in chloroform. It crystallizes in long slender needles, and is freely soluble in water, less so in alcohol and ether, and insoluble in chloroform and petroleum spirit. When lime water is added to a solution of this acid no precipitate is produced, and when the solution is heated no turbidity results. When alcohol was added to this solution no precipitate was produced. Solution of subacetate of lead produces a white precipitate soluble in acetic acid; a solution of gelatin produces no precipitate. A mixture of ferrous and ferric salts in solution gives no discoloration. The acid decomposes the alkaline carbonates, combines with the alkali, and forms crystallizable salts.—Nat. Drugg., July 23, 1886, 47.

Mutisia Viciæfolia, Cavanilles—*Remedial Uses.*—This plant is stated by Mr. Naudin, on the authority of Dr. Sacc, of Bolivia, to enjoy the reputation of curing phthisis and all pulmonary diseases. The plant is indigenous to the western part of South America from Chili to Peru, and belongs to the labiatifloral compositæ, which are confined chiefly to South America, and the leaves of which are usually mucilaginous, somewhat bitter, and occasionally more or less aromatic. A number of species are locally used as expectorants.—Jour. d' Hygiene, 1886.

VALERIANACEÆ.

Valeriana—Microscopical Examination.—Prof. Joseph Schrenk observes that it is quite difficult to prepare good thin sections for examination from the rhizome of *Valeriana*, because in the pith of the rhizome there are quite frequently found several horizontal cross partitions, which consist chiefly of very hard sclerenchyma cells. The root-stock should be soaked for a day or two in a weak solution of ammonia, and then in a mixture of glycerin and alcohol. Even then very cautious manipulation is necessary, lest the knife be ruined. As the rootlets form a considerable portion of the bulk of this drug, it is perhaps worth while to know that they do not contain simply "a slender vascular cord," but a ring of fibro-vascular bundles surrounding a narrow pith.—Amer. Drugg., April 1887, 61.

Valeriana Hardwickii, Wallich.—*Proximate Examination of the Rhizome.*—Mr. J. Lindenberg has made an analysis of the rhizomes of the East India valerian (*Valeriana Hardwickii*, Wallich), and compared with one of *Val. officinalis*, Lin. The direct determination of valerianic acid, total albuminoids, and total water soluble substances, gave for the former 1.37, 11.06, and 28.59 per cent. respectively, and for the officinal drug 1.21, 9.38 and 24.88 per cent. The results of the quantitative analysis were:

	V. Hardw.	V. officin.
Moisture	10.46	11.57
Ash	4.04	4.31
Fat and resin, soluble in petroleum benzin	0.56	0.36
Volatile oil and valeric acid, soluble in benzin	1.005	0.90
Volatile acid soluble in ether	0.335	0.31
Resin and wax, soluble in ether	0.56	0.85
Resin, soluble in alcohol	1.05	0.975

	V. Hardw.	V. officin.
Tannin	3.13	1.64
Citric, tartaric and other acids	0.335	0.565
Glucose	6.03	5.32
Other substances, soluble in water, insoluble in alcohol	14.96	14.39
Mucilage and albumin soluble in water	4.16	2.97
Albuminoids extracted by soda	9.72	7.83
Metarabic acid, phlobaphene and albuminoids	19.10	16.70
Starch	14.05	12.87
Cellulose	10.36	11.65
Lignin and other compounds	10.015	16.80

—Pharm. Zeitsch. f. Russl., 1886.

RUBIACEÆ.

Cinchona—Cultivation in Madras.—Mr. David Hooper has communicated some of the results obtained in the course of his quinological work in the Madras cinchona plantations. Shaving cinchona trees as a method of harvesting bark is now very general, but the question as to the limit to the constant and successful shaving of the tree is not yet fully understood. It has been found that when operating on trees of six years old the increase in the amount of quinine during the first and second renewal at intervals of twelve months was most satisfactory, but the increase was not so marked in the third year renewal, although the conclusion arrived at is that renewal by shaving might be permitted for at least four years. The beneficial effect of renewal by shaving was very marked in the case of a six-year old succirubra, which yielded twice as much quinine sulphate as from a natural succirubra of twice that age; but the operation was not satisfactory in its results when applied to trees of sixteen to twenty-one years, as such old trees will not bear the shaving treatment. The application of cattle manure to cinchonas seems, from the results of three sets of experiments on succirubra and magnifolia trees, to have the effect of increasing the amount of total alkaloids, and in two instances the amount of quinine, by 52 per cent. and 20 per cent. respectively; but the usefulness of the application of manure was not so marked in old trees, and it is believed that the effect of manuring would be more apparent in Crown and Ledger barks. It is also stated that the maximum yield of quinine in Ledger and succirubra barks seems to be attained when the trees are between the age of five and six years, as after that time there is no sensible increase in the amount of quinine. Another point ascertained was that bark which had been kept for ten months in a damp room, and had become mouldy in consequence, had not deteriorated as regards the amount and quality of the alkaloids.—Yearbook of Pharm., 1886, 555–561.

Cinchona—Cultivation in South America.—Mr. David Howard, in a paper on cinchona cultivation in South America, observes that it is to other countries than Ceylon, which occupies at present the most prominent position of all the countries where cinchonas have been cultivated, that we must look for the solution of the scientific points involved in the cultivation of cinchonas, owing to the little care that has been taken in Ceylon to avoid the danger of hybridization. Unfortunately, very little scientific information can be obtained from South America, the natural home of the cinchonas, except what little can be derived from the study of the cultivated bark which reaches us from that country. Among the cinchonas under cultivation in South America are two new species, *C. Thomsoniana*, named after Mr. Thomson, who discovered it in the Central Cordilleras, the home of the well-known *C. lancifolia*, and another discovered by Señor Pombo in Ecuador. *C. Thomsoniana* gave on analysis of the bark of a two-year old tree 3.3 per cent. quinine sulphate, trace of cinchonidine, and 0.55 per cent. cinchonine. The bark from the other species of the same age gave 5.7 per cent. quinine sulphate, 0.43 per cent. cinchonidine, with no cinchonine or quinidine. The improvement brought about by the successful cultivation of the cinchonas is further shown by the results obtained from the same plantations in 1872 and 1881 of the several kinds of cinchonas grown in Jamaica, and these results were even more favorable in the cultivation in Columbia of descendants from the Jamaica plantations. In the case of a succirubra cultivation in Columbia from a Jamaica plant, the bark yielded as much as 7.0 per cent. quinine sulphate, with only 1.9 per cent. cinchonidine, and 0.67 per cent. cinchonine, and Mr. Howard remarks that this succirubra is one of the finest he has tested. In Mr. Howard's opinion it cannot be too clearly borne in mind that the prospect of future profits in the cultivation of cinchonas depends entirely on the cultivation of the high testing bark, for in the face of the importation of such highly valuable cultivated bark from Bolivia, as well as from Java, the profitable growing of inferior bark is impossible.—Yearbook of Pharm., 1886, 561–564.

Cinchona Barks—Analyses of the Collection in the U. S. National Museum.—Mr. George E. Doering has made analyses of the cinchona barks on exhibition in the Materia Medica section, U. S. National Museum. The author gives a description of the method employed, and communicates the results in a table embracing the exhibition number of the samples, the name, locality of its growth, description, amount of ash, and alkaloids, both total and soluble in ether. It may be interesting for reference to give the number and kinds of bark embraced by the author's analyses, viz:

Cinchona Anglica	3	specimens	from Madras.
" Javanica	2	"	" Java.
" Hasskarliana	1	"	" "
" Pahudiana	3	"	1 " " 2 " Madras.
" Pelletierana	1	"	" South America.
" Schukraft	1	"	" Java.
" Hybrid	4	"	2 " India. 2 " Jamaica.
" Pitayensis	1	"	" Madras.
" Micrantha	1	"	" "
" Cordifolia	1	"	" Venezuela.
" Carabayensis	1	"	" Brazil.
" Officinalis	23	"	4 source not given. 12 from Madras. 1 " South America. 1 " Java. 2 " Ceylon. 3 " India.
" " Condaminea	3	"	" Madras.
" " Angustifolia	4	"	" "
" Pubescens	14	"	" "
" Succirubra	24	"	2 source not given. 1 from Mexico. 2 " South America. 10 " Madras. 1 " Ceylon. 1 " Java. 6 " India. 1 " Jamaica.
" Calisaya	11	"	2 source not given. 1 from Mexico. 6 " India. 1 " Jamaica. 1 " Java.

Reference may be had to the author's paper in West. Drugg., May 1887, 155–156; from Proc. U. S. National Museum.

Cinchona Barks—Assay of Commercial Samples.—Mr. Clarence H. McCoy has determined the amount of total alkaloids and of quinine in three samples of cinchona bark by the process of the U. S. P. Two of the samples were also analyzed by Dr. Squibb's process (Ephemeris I, 105). The results were as follows:

	Total Alkaloids.		Quinine.	
	U. S. P.	Dr. S.	U. S. P.	Dr S.
Cinch. succirubra	5.385	5.58	1.265	2.16
Cinch. officinalis (Neilgherry)	9.79	9.82	1.93	2.24
Cinch. Calisaya (quill)	5.275	——	1.35	——

—Amer. Jour. Pharm., Febr. 1887, 69.

Cinchona Barks—Method of Assay.—Mr. Kaspar has tried different methods recommended for the assay of cinchona barks. He finds that Lösch and Flückiger's methods and all those requiring much heat yield small percentages. Coëytaux's method also yields a small percentage. Mayer's and Rabourdin's methods give the most satisfactory results. In Rabourdin's, however, a 10 per cent. caustic soda was substituted for the caustic potash and repeated extraction with chloroform. From 10 grams of succirubra bark, treated as below mentioned with hydrochloric acid and alcohol, the yield according to the different methods was as follows:

Coëytaux	0.515 grams.
Lösch	0.565 grams.
Flückiger	0.613 grams.
Rabourdin	0.840 grams.
Mayer	0.882 grams.

To exhaust the bark some use acidulated water; others use acidulated alcohol; some mix the bark with ammonia or caustic soda and then extract with ether, benzol or amylic alcohol; some mix the bark with lime or magnesia and water and evaporate to dryness on a water bath, then exhausting with the above mentioned solvents. The following table shows the quantities of different menstrua required to exhaust 10 grams of an 8.8 per cent. succirubra bark:

Water	1100.00 grams.
" with 1.50 sulphuric acid	650. grams.
" " " " " and 2.0 glycerin	350. grams.
Diluted alcohol	150. grams.
Stronger	90. grams.

In order to hasten exhaustion the bark was mixed with 50 grams of acidulated water and heated by means of a water bath, but the solutions were turbid; then muriatic acid and alcohol were used with much better results. Hydrochloric acid is preferable to sulphuric acid, because an excess can readily be evaporated. Kaspar's method is as follows: Into a flask holding about 150 cc. and connected with a condensing tube, are placed 50 cc. of 90 per cent. alcohol, 20 drops of dilute hydrochloric acid and 10 grams of finely powdered bark, the whole heated in a water-bath for 10 minutes, then expressed, the operation repeated with 50 cc. of alcohol and 10 drops of dilute hydrochloric acid, expressed, and treated for the third time with 50 cc. alcohol and expressed; the liquids are mixed, filtered and evaporated—stirring constantly—to 10 grams.

Mr. Kaspar recommends as most reliable the following modification of Rabourdin's process: 15 grams 10 per cent. solution caustic soda, 10 grams of the fluid extract, and 15 cc. of ether are mixed in a tube 30 cm. long and 2 cm. wide. The mixture is shaken frequently and allowed to stand one day, the ethereal layer is removed with a pipette, and the operation repeated twice more, using in each instance 15 cc. of ether. The ethereal solutions when mixed, filtered and evaporated yield besides traces of other bases, the crystalline and amorphous quinine. The alkaloids, which are insoluble in ether, are extracted in the same way as the quinine, using 15 cc. of chloroform in each operation. The filtered chloroformic solutions are evaporated and the residue figured as quinidine, cinchonine and cinchonidine.—Amer. Jour. Pharm., Oct. 1886, 492–493; from Schweiz. Wochensch. f. Pharm., No. 24, 1886.

Cinchona Bark—Ash Constituents.—Mr. David Hooper, Government quinologist, has been engaged in examining the inorganic constituents of cinchona bark, and now communicates some notes relating to the amount and quality of the ash occurring in the bark of two species of cinchona grown on the Nilgiris, the *C. officinalis* growing in the Dodabetta plantation, and the *C. succirubra* from the lower elevation at Naduvatam. Notwithstanding the barks were from different species and localities, the result of the examination shows that there is a great similarity in the composition of the ash.

	C. officinalis.	*C. succirubra.*
Soluble in water	27.33	24.46
Soluble in acid	66.92	69.94
Residue	5.75	5.60
	100.00	100.00

	C. officinalis.	*C. succirubra.*
Insoluble silica	5.75	5.60
Soluble silica	1.42	4.40
Alumina	2.70	4.24
Iron oxide	2.85	3.21
Manganese	trace	—
Lime	32.70	32.80
Magnesia	2.07	2.52
Potash	16.35	12.49
Soda	3.40	2.28
Carbonic acid	27.22	27.77
Sulphuric acid	1.16	1.08
Phosphoric acid	3.93	3.19
Chlorine	.45	.42
	100.00	100.00

The chief constituent is the lime, which forms nearly one-third of the whole, and exists in the ash in the form of carbonate. The next element of importance is the potash, which amounts to one-sixth and one-eighth of the whole ash respectively. The author's analyses agree on the whole with the analyses of cinchona of Mr. P. Carles, published some fourteen years ago, though the latter found copper and appreciable quantities of manganese.—Pharm. Jour. and Trans., Jan. 8, 1887, 545–546.

China Bicolor—Characters of Alkaloid in the Bark.—The bark of *China bicolor*, known as "Tecamez bark" and "Pitoya bark," was stated by Vogl (1876), to be very similar in stratum to cuprea bark. Karstus believed it to be derived from a Pinckneya, while Hodgkin (Yearbook of Pharmacy, 1884, 54) regards the plant yielding the bark to be a Remijia. Dr. O. Hesse has now re-examined the bark, and concludes that its origin is still uncertain. He obtained an alkaloid, not exceeding 0.1 per cent., which seems to be related to some of the alkaloids of *Remijia Purdieana* (see Proceedings 1885, 303–305), but the bark was absolutely free from cinchona alkaloids. The alkaloid is soluble in ether, chloroform, and dilute sulphuric acid, with an intense yellow color; the latter solution yields with a little ammonia or potassa a dark yellow precipitate, and dingy yellow precipitates with the chlorides of platinum and of gold, and with strong nitric acid; the solution was completely decolorized and deprived of alkaloid by treatment with a little animal charcoal. Hodgkin had obtained from the specimen of bark examined by him 0.75 per cent. of alkaloids, of which 0.225 was quinine, 0.06 cinchonine, 0.05 quinidine, the remainder being amorphous. Dr. Hesse suggests that these results may be accounted for by the admixture of some bark of *Remijia pedunculata*. Pelletier had analyzed the bark in 1825, and found no quinine, while Peretti (1834–35) reported the isolation of *pitoyine*, a tasteless alkaloid forming bitter salts.—Liebig's Annal., 234, 280; Amer. Jour. Pharm., Feb. 1887, 77–78.

Coffee—Effect of Roasting, with Special Reference to the Amount of Caffeine.—In connection with their former (see Caffeine) experiments, Messrs. Paul and Cownley had expressed the opinion that under ordinary conditions, very little, if any, of the caffeine is lost by volatilization in the roasting of coffee. The authors now communicate the results of some experiments undertaken with a view to establishing the correctness of this opinion. In one experiment the roasting of the coffee was carried on to an extreme degree, the product being very dark brown, having lost part of the fine aroma and being evidently over-roasted. In a second experiment the roasting was carried just far enough to give the berries a fine chestnut-brown color. These had the fine aroma to perfection, whilst in a third experiment, the coffee being roasted to a pale brown color, the aroma seemed not to be fully developed. The following table shows the results of the experiments, portions of the same coffee being treated as therein indicated:

Coffee.	Loss of weight in roasting, per cent.	Caffeine.		
		In raw coffee per cent.	In roasted coffee.	
			Found per cent.	Calculated per cent.
Low roasted	13.7	1.10	1.30	1.28
Medium roasted . . .	16.0	1.10	1.36	1.31
Over roasted	31.7	1.10	1.25	1.61

The authors conclude their paper with some practical remarks on the process of roasting coffee, as well as upon the manner of making the infusion. For the latter they recommend the method of percolation in common use in France, whereby about 88 per cent. of the caffeine is extracted.—Phar. Jour. and Trans., April 9, 1887, 821–822.

Coffee—Estimation in Admixtures with Chicory.—In continuation of their above paper, Messrs. Paul and Cownley record some experiments made to determine the amount of coffee present in mixtures with such materials as chicory. Graham, Stenhouse and Campbell had suggested the possibility of determining the percentage of coffee in such mixtures by a determination of the caffeine present, but their experiments led them to the conclusion that this method was altogether too tedious. For this reason they recommended the method of testing coffee which has hitherto been in use, which is dependent upon certain properties of the infusion of a physical character. This is based upon the fact that, as compared with coffee, chicory, and other materials likely to be used as admixtures, yield to boiling water a much larger amount of soluble extractives, and consequently give infusions having a greater specific gravity than that of pure coffee. Supplementary tests based on the determination of the amount of sugar and fat, and microscopical examination, have with the above been the only available means of determining the character of such mixtures. Messrs. Paul and Cownley find, however, that the results thus obtained are open to objection on the ground that the substances determined and taken as the standard of purity and the measure of adulteration are not specific constituents of the coffee. The test based on the specific gravity of the infusion is also open to objection, because in the case of coffee adulterated with chicory, the results thus obtained would be influenced by the kind of chicory that had been used for the purpose, since chicory from different sources yields different amounts of extractive to boiling water. By the experiments of the authors Belgian chicory yielded 60 per cent.; German, 59 per cent.; English, 49 per cent., and French chicory, 47 per cent. Thus in a mixture of Belgian chicory and coffee, yielding 32.98 per cent. of extract, 14.2 per cent. would have to be credited to coffee, and 18.96 per cent. to the chicory, corresponding to 68.4 and 31.6 per cent. of coffee and chicory respectively. If, on the other hand, French chicory had been used, then only 10.84 per cent. would be credited to coffee, and 22.14 per cent. to the chicory, corresponding to 52.9 and 47.1 per cent. of coffee and chicory respectively. Pure coffee yields to boiling water in 10 per cent. decoction, 20.5 per cent. of solid extract. Finding, therefore, the older methods to be liable to great uncertainty, the authors tried their method of the direct determination of caffeine in coffee, and find it perfectly satisfactory as applied to its mixture with chicory. The only additional precaution which they advise, is to dry the mixture of coffee and lime before extracting with alcohol, and to dissolve the caffeine obtained in a small quantity of water, and filtering to separate a little adherent resin before weighing. In a recorded experiment made with mixtures of equal parts of chicory and coffee of known caffeine strength, the amount of caffeine thus obtained was slightly higher than that expected, the increase being due to the tenaciously adherent resin referred to; but the results were sufficiently near for all practical purposes, and far more so than those based upon the amount of extractive obtained. The authors propose to calculate the amount of coffee on the basis of 1.3 per cent. of caffeine found by them to be contained with tolerable uniformity in pure roasted coffee.—Phar. Jour. and Trans., May 14, 1887, 921–922.

Coffee.—Percentage of *Caffeine*, which see under "Organic Chemistry."

Ipecacuanha Root—Composition of Ash.—Mr. H. E. Munns has obtained 3.22 per cent. of ash from ipecacuanha root, which had the following composition: Silica, 31.98; iron and alumina, 3.53; lime, 15.98; magnesia, 4.57; phosphoric anhydride, 6.19; alkalies, 13.80; sulphuric anhydride, 4.84; chlorine, 1.56; carbonic anhydride, 15.25; undetermined, including a trace of manganese, 2.30.—Pharm. Jour. and Trans., April 30, 1887, 898–899.

Ipecacuanha.—Presence of Bilineurine or Choline along with *Emetine*, which see under "Organic Chemistry."

Ipecacuanha.—Estimation of *Emetine*, which see under "Organic Chemistry."

Mitchella Repens, L.—*Proximate Analysis.*—Mr. Edgar Brenneiser has made a proximate analysis of *Mitchella repens, L.*, with the following results: Volatile oil was found to be absent. Petroleum-benzin dissolved 1.180 per cent., consisting of chlorophyll and wax, the latter saponifiable by alcoholic potassa solution. Ether took up 1.400, of which .240 was soluble in water, and .940 soluble in alcohol. The aqueous solution contained a principle precipitated by tannin and by picric acid, but neither alkaloid nor glucoside. The resin taken up by alcohol was soluble in potassa, and this solution yielded nothing to benzin, benzol or chloroform; the liquid obtained on treating the resin with acidulated water, gave precipitates with tannin and picric acid, but yielded nothing to benzin, benzol, or chloroform. The alcoholic extract of the plant amounted to 3.800 per cent., of which 3.440 was soluble in water, and this contained 1.630 glucose, estimated by Fehling's solution. Water now dissolved from the plant 20.699 per cent., from which alcohol precipitated 5.440 mucilaginous matter and .536 inorganic compounds; the further addition of alcohol precipitated 3.679 dextrin and allied carbohydrates; 6.009 glucose was found; also a saponin-like principle (precipitated by baryta, and frothing in aqueous solution). Dilute soda solution dissolved 2.360 albumin, 1.840 other organic matter, and .120 inorganic matter; total, 4.320 per cent. Dilute hydrochloric acid took up 4.418 organic, and 2.820 inorganic matter; total, 7.238. Treatment with chlorine occasioned a loss of 11.784 per cent.; the residue now weighed 33.460, and after deducting 11.240 for moisture in the drug, the loss not accounted for by the analysis amounts to 4.879 per cent. The ash of the air-dry plant weighed 5.440 per cent., only .360 of which was soluble in water; the ash consisted of carbonates, chlorides, sulphates, and phosphates of sodium, potassium, calcium, magnesium and iron.—Amer. Jour. Pharm., May 1887, 228–229.

UMBELLIFERÆ.

Umbelliferous Plants of Afghanistan—Collection of their Products, etc. —Mr. J. E. T. Aitchison, naturalist with the Afghan Delimitation Commission, has had opportunity during 1885 to study the occurrence of various umbelliferous plants in Afghanistan, and witnessed the manner of collecting their exudative products. In a paper read at an evening meeting of the Pharm. Society of Great Britain (December 8, 1886), he observes that the country in which the *Umbelliferæ* flourish consists of great shingle and conglomerate plains, lying between the hills and the beds of rivers at an altitude of from 2000 to 4000 feet above the sea level. These plains during winter are perfectly treeless, arid, and bare, and remain so until, as the summer advances, a complete change comes over the scene; these bare plains become rapidly covered with a mass of splendid verdure, produced chiefly by the presence of the following umbelliferæ, viz.: *Ferula Fœtida*, Regel, *Dorema Ammoniacum*, Don, and *Ferula Galbaniflua*, Boiss and Buhre. The two former usually occur associated together, whereas the latter is generally found alone. The habit of growth of these three species is much the same; they all produce a great show of foliage thrown out from their perennial root-stocks. This foliage spreads out on the ground to a diameter of circle round the base of the flowering stems little under six feet, the close approximation of the foliage to adjacent plants giving to the country its wonderful appearance of a never-ending pasturage. This wonderful verdure lasts from the end of

April to the beginning of July; by the end of that month it has as suddenly disappeared as it originated, even to the fruit-bearing stem, and by August not a trace of the past season's vegetation is left, the hot sun having dried the plant to cinders, which are removed completely by the prevailing winds. Respecting the collection of the gum-resins of these plants, the following may find place here.

Asafœtida.—A few men, employed for the purpose by some capitalist at Herat, are sent to the asafœtida-bearing plains during June. They begin their work by laying bare the root-stock to a depth of a couple of inches of those plants only which have not as yet reached their flowering stage. They then cut off a slice from the top of the root-stock, and, without collecting the milky juice which at once exudes, they cover over the root by means of a domed structure of from six to eight inches in height, called a *khora*, formed of twigs, and covered with clay, leaving an opening towards the north, thus protecting the roots from the sun. The drug collectors return in about five or six weeks, when a thick, gummy, not milky, reddish substance, is found on the surface of the exposed root, in form of irregular lumps, having the appearance of the ordinary asafœtida of commerce. This is scraped off with a piece of hoop iron, placed at once in a bag of tanned kid or goat skin, and conveyed to Herat, where, the author says, it usually underwent the process of adulteration with a red clay, táwah, and where it was sold to certain expert traders, called *Kákri-log*, who convey it to India.

Ammoniac.—When the plant has reached its fruiting condition it is very liable to be attacked by boring insects, especially in the fruiting heads, the result of which is the rapid escape of a large amount of milky fluid, which, upon exposure, soon becomes tenacious and gummy, forming into solid concrete lumps, which are collected by simple removal from the plant, or, later in the season, from the ground.

Galbanum.—As in the case of ammoniac, no artificial means are employed in the collection of galbanum. The stem, on injury, from its earliest stage of growth, yields an orange-yellow gummy fluid which very slowly consolidates, usually forming on the stem, like the grease on a guttering candle, and possessing in common with the whole plant when crushed a strong odor resembling that of celery. The gum-resin is commonly found adhering to the lower portions of the stem, and is so tenacious that when subsequently examined pieces of the plant are frequently attached to it. It is stated to be an article of export through Persia *viâ* the Gulf to Arabia and India.—Pharm. Jour. and Trans., Dec. 11, 1886, 465–467.

Asafœtida—Occurrence of Vanillin.—Which see under "Organic Chemistry."

Asafœtida, Ammoniac and Galbanum—Structure, etc., of the latici-

ferous vessels of the plants yielding them.—Mr. A. Tschirch has made a comprehensive study of the structure and arrangement of the lacticiferous vessels in the plants yielding the gum-resins asafœtida, ammoniac and galbanum. The author's paper is illustrated by numerous cuts showing the microscopic structure of the parts of plants examined, too numerous to find place in this report, whilst the text cannot be profitably abstracted, without their reproduction. Reference must therefore be had to the original paper.—Arch. d. Pharm., Oct. 1886, 817–844.

Galbanum—Examination of an Afghan Variety.—Mr. E. G. Baker has subjected a sample of galbanum collected by Dr. Aitchison in Afghanistan (see above) to chemical examination. It consisted of agglutinated tears of a white or reddish-brown color, usually compact and hard, softening if held in the hand, presenting a dull waxy fracture, resembling ordinary ammoniac (for which, indeed, it might easily be mistaken), and having a peculiar but not unpleasant odor. Portions of the stem from which it was obtained were mixed with the gum-resin. Subjected to chemical examination a fair sample of the whole yielded the following: Volatile oil, 3.108; resin (ether extractive 61.2, alcohol extractive 7.576), 68.776; water extractive (gum), 17.028; insoluble matter, 10.56 per cent.—Pharm. Jour. and Trans., Dec. 11, 1886, 468–469.

Ferula Suaveolens, Aitch. et Hemsley—*Description of a New Afghan Species.*—Mr. Aitchison also draws attention to a new species of *Ferula* observed by him in Afghanistan, and designated as above. It is a plant from 3 to 4 feet in height, and grows, at an altitude of 5,000 feet, in the hills to the south of Bézd. The root of the plant, which is scented, is collected and exported through Persia to the coast. It yields some form of gum resin, which, however, the author was unable to collect.—Ibid, 467.

Sumbul Root.—Formation of Angelic and Methylcrotonic acid by the action of alcoholic caustic potassa. See under "Organic Acids."

Anise—Admixture of Conium Seed in the Italian Drug.—Mr. C. L. Lochman having on different occasions experimented upon the cultivation of anise seed, invariably found a large number of the plants to be *Conium maculatum* when he planted the Italian seed, whereas the German seed was invariably free. He judges the proportion of conium fruit in Italian anise to be from 2 to 5 per cent. or more, and his experience seems to point to its invariable presence in the drug from that source. While conium is a biennial plant, in conformity with aberrations of the usual law, his plants produced fruit during the first year, along with the anise.—Amer. Drugg., May 1887, 81.

RANUNCULACEÆ.

Aconitum Napellus, L.—*Incorrect Description of the Structure of the*

Root in the Pharmacopœia, etc.—Prof. Joseph Schrenk observes that the structure of the root of aconite is not correctly described in our Pharmacopœia and in Maisch's "Materia Medica." The latter says: "Nucleus sheath about seven-rayed." The *nucleus sheath* or endodermis of the aconite root is found quite close to the surface; it is nearly circular and consists of a single layer of tangentially elongated cells. It is the *cambium zone*, consisting of about eight rows of cells, which presents on the cross-section the appearance of an irregular star, with from five to nine rays. The cambium line, of course, incloses the entire woody portion of the fibro-vascular bundles, not the pith only, as the pharmacopœia might lead to believe by speaking of the "seven-rayed pith."—Amer. Drugg., April 1887, 61.

Hydrastis—Colorless Preparations.—Mr. John L. Irwin records some experiments respecting the character and composition of the colorless preparations of hydrastis. He concludes that these preparations, *per se*, can not contain any berberine, and that such virtues as they possess must be dependent upon one of the other alkaloids of the drug, which can be found in a colorless preparation or solution.—West. Drugg., November 1886, 405.

Cypripedium Pubescens—Orchidaceæ—Variation in the Endodermis.—Prof. Jos. Schrenk observes that while Gray ("Manual," p. 512), and Maisch ("Materia Medica," p. 124), both mention that this species of cypripedium grows in bogs and low woods, and swampy places, he has frequently found it well established in rather dry woods on hill-sides, although not so luxuriant as in wet places. Maisch says of the rhizome: "nucleus sheath absent." Prof. Schrenk has examined numerous specimens, both of the commercial drug and of the living plant gathered by himself, and in all of them he found the endodermis distinctly enough to leave no doubt of its presence. In some cases the endodermis can be detected only with difficulty, because the walls of the cells are hardly thickened at all, and might easily be mistaken for cells belonging to the adjoining "ground tissue." But by applying the proper reagents the cutinized radial walls characterizing all endodermis cells are plainly seen. In most cases, however, these tests are not necessary, for usually the endodermis cells have their walls much thickened, either all around, or on the inner (centripedal) and radial sides only. In the former case, thick-walled cells are freely intermingled with thin-walled ones; in the latter case, there are only few cells with their walls. This great variation in the structure of the endodermis in the rhizome of *Cypripedium pubescens* is the more remarkable, since upon the constancy of the shape and mode of thickening of the endodermis cells, specific distinctions have been based in the case of many plants. The differences above observed appear to be due, to a certain extent at least, to the locality of its growth, i. e. in boggy woods or in dry woods. The author's paper is accompanied by a cut showing these differences in the structure of the endodermis cells, which see in Amer. Drugg., Jan. 1887, 2–3.

Delphinium Lalil, Aitch. et Hemsley, *nov. sp.—Use of the Flowers in Afghanistan.*—Mr. J. E. T. Aitchison describes a new species of *Delphinium*, which he found in great luxuriance at an altitude of 3000 feet in the moister localities of the Badghis and Khorásan. It is called by the natives *Lalil, Isparak, Isburg, and Aswarg.* The flowers are of a brilliant yellow color when fresh, and are employed in native medicine as a tonic and alterative, but are usually exported from Persia and Afghanistan as a dye stuff.—Pharm. Jour. and Trans., Dec. 11, 1886, 468.

Pæonia Montana—Isolation of an Aromatic Ketone from the Root.—Mr. W. Will has succeeded in isolating from the aqueous distillate of the root of this Japanese pæonia a colorless crystalline body, melting at 47°, which is present in the dry root to the extent of 3–4 per cent. Mr. N. W. Nagai is engaged in the study of this compound, which he has identified to be an aromatic ketone.—Arch. d. Pharm., Sept. 1886, 806; from Ber. d. D. Chem. Ges., xix, 1777.

Anemone Pulsatilla—Constituents, etc.—Mr. P. Vigier makes some observations on this plant which, while adding little to the present knowledge of it, are of sufficient interest to be recorded here. He makes no claim for its medicinal virtues beyond its sedative effect, and the fact that, taken internally, it reduced the catarrhal fever of a cold in the head and nearly stopped the nasal secretion. He states that the distillations when bottled and put aside lose their bad odor and acridity, and deposit anemonin. Alkalies dissolve it readily, making anemonates. He finds the atomic formula to be $C_{15}H_{12}O_6$ [agreeing with Fehling], the anemonic acid having one more equivalent of oxygen. "A curious peculiarity is that hydrochloric acid dissolves the anemonin without altering it, whilst nitric and sulphuric acids destroy it rapidly." He has often taken 10 centigm. of it without toxic effect; 2 to 4 centigm. a day were enough to get the anti-catarrhal effect and that on the nervous system. The leaves lose their properties by desiccation; the roots do not, and these possess the medicinal properties of the plant in a much higher degree. They are gathered in June. Equal parts by weight of the root and alcohol at 90 are macerated for fifteen days. The mixture keeps well. The dose is 2 to 4 gm. a day—less than that of the tincture made from the leaves. He proposes a syrup of syr. aurant. flor. 95 gm., and tincture (as above) 5 gm.; 2 to 4 gm. daily, in water.—Gaz. Hebdom., May 27 and June 3, 1887.

MAGNOLIACEÆ.

Magnoliaceæ—Description of Indigenous Species and Constituents of "Magnolia Bark" (from *M. glauca*).—Messrs. J. U. and C. G. Lloyd give a description of the different indigenous magnolias, viz.: *M. glauca*, *M.*

acuminata, *M. umbrella* and *M. grandiflora*, illustrating the same by a number of handsome cuts, showing the leaves, flowers, flower-organs and fruits of several species. He also reviews the chemical history of "magnolia bark," which as it occurs in commerce, appears to be gathered principally in the mountainous districts of North Carolina indiscriminately from *M. glauca*, *M. umbrella*, and *M. macrophylla.* The authors have subjected the bark of *M. glauca* to proximate examination. They obtained three resins, separable by solvents, and a crystalline glucoside, which is soluble in alcohol and in ether, but insoluble in water and in dilute acids. In its general characters it resembles the *magnolin* observed by Wallace Procter. Their endeavor to isolate an alkaloid was unsuccessful, though they obtained an alkaloidal reaction in one of the solutions obtained during their researches. Besides the substances resembling Procter's magnolin, a second crystalline and fluorescent body was isolated, which requires nearer examination.—Pharm. Rundschau, 1886, 224–227 and 266–268.

Liriodendron Tulipifera, L.—Proximate Constituents.—Messrs. J. U. and C. G. Lloyd give a description of the various parts and organs of the tulip tree, accompanied by handsome illustrations of the leaves, flowers, flower-buds, etc., which may be consulted in "Pharm. Rundschau" (Aug. 1886, 169–171). Respecting the constituents of the bark, they mention that a resin was determined by Dr. Rogers in 1802, and in 1831 Mr. J. P. Emmet described a crystalline resin to which he gave the name *liriodendrin.* Mr. J. U. Lloyd has now determined the characteristic constituents of the bark to be a bitter extractive, an alkaloid, a brown amorphous resin, and a volatile oil. The alkaloid, which, in contradistinction to Emmet's supposed crystalline resin, liriodendrin, Mr. Lloyd proposes to call

Tulipiferine, is colorless, somewhat soluble in water, and readily soluble in dilute acids. It is present only in small proportions, and has not been obtained in a crystallized condition. It exhibits the usual alkaloidal reactions, is colored by conc. sulphuric acid yellow, changing to red, and with sulphuric and nitric acid light red. According to preliminary experiments made by Prof. Robert Bartholow, the new alkaloid appears to possess toxic properties, and to have an energetic effect upon the nerves and heart action when given in small doses.

ANONACEÆ.

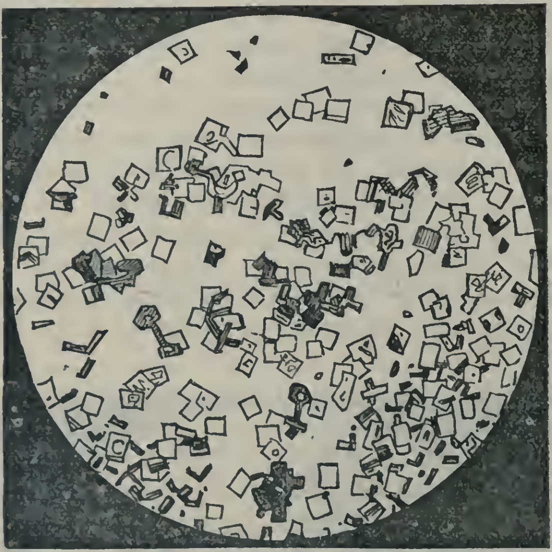
Asimina Triloba—Proximate Constituents.—Messrs. J. U. and C. G. Lloyd, after giving a careful description of the common pawpaw plant, accompanied by illustrations showing the character of the leaves, flowers, fruit and seeds, give the results of their chemical examination of the different parts of the plant. The plant has hitherto not been subjected to such examination. The authors find that all parts of the plant contain a volatile oil having an unpleasant odor. The bitter principle of the bark was not separable from extractive matter either by solvents or by crystallization. From the seeds, however, they have succeeded in separating an alkaloid which they have named

Asimine.—This also they have been unable to obtain in a crystalline condition, but some of its salts, notably the hydrochlorate and sulphate, were obtained in crystals. The pure alkaloid is colorless, odorless, tasteless; insoluble in water, easily soluble in alcohol and in ether, but not so readily in chloroform or benzol. The salt most readily obtained pure and in crystals is the hydrochlorate. The appearance of both this and of the sulphate under the microscope is shown by the accompanying cuts (see Figs. 17 and 18). By nitric acid asimine and its salts produce a transient carmine-red, then deep violet. The reaction is very sensitive, and very similar to that of morphine, from which it is distinguishable in that the primary reaction is carmine-red and not blood-red, and that instead of becoming lighter it becomes darker and violet. With conc. sulphuric acid asimine produces effervescence, is dissolved with a green color, which gradually changes to yellow, yellowish-red, and finally permanent deep red. Hydrochloric acid produces no reaction by itself, but on the addition of sulphuric acid and gently heating, a red color is produced similar to that produced by morphine under the same conditions. Pure asimine is not affected by chlorine water, but its hydrochlorate is precipitated by it (distinction from morphine).—Pharm. Rundschau, 1886, 368–370.

FIG. 17.

Asimine Sulphate.

FIG. 18.



Asimine Hydrochlorate.

MENISPERMACEÆ.

False Pareira Brava—Characters of Distinction.—Mr. Wm. Kirby, in a paper read before the Br. Pharm. Conference, 1886, draws attention to a false pareira brava, which was sent to him by Mr. E. M. Holmes, under the name of "West Africa pareira brava." After pointing out the essential histological characters of true pareira brava, he very fully describes those of the substitute, which is composed of several stems and roots, among which a very small percentage of true pareira, the bulk being made up of a stem and a root, another stem and root making up the minor portion. For the detailed description of these several components, reference may be had to the author's paper. His concluding observations may find place here: "The stem of the West African substitute differs from that of *Chondondendron tomentosum* in not having the very characteristic strands of sclerotic cells in the pith, in the smaller diameter of its vessels, in the absence of the great number of stone cells in the cortex. Starch is more abundant in the false stem, and it does not exhibit any long truncated granules. The root differs in having a distinct central point free from wood, in the smaller width and length of the vascular bundles and smaller diameter of the vessels, in the narrow cork layer being closely adherent, and in exhibiting the same difference in the granules of starch and the stem." The peculiar physical characters of this false pareira brava are summarized as follows: "It has a chocolate-brown color externally, and a yellow or brownish-yellow color internally.

It has a great number of woody zones, instead of three or four. In the larger pieces there is an eccentric arrangement of the zones. The root portions have a star of small size in the center, with a variable number of straight, not twisted, rays. And finally, the woody wedges are narrow and have vessels with a small diameter. These are the most striking characters, and will serve to readily identify the substitute." The author's paper is accompanied by cuts exhibiting the vascular bundles of the inner zones of the root of *C. tomentosum* and of the West African pareira brava, magnified equally, as well as a transverse section of the latter root of natural size.—Year-Book of Pharm., 1886, 447–457.

RUTACEÆ.

Xanthoxylum Fraxineum, Willd.—*Proximate Examination.*—Mr. Edward T. Moffit has examined the bark of *Xanthoxylum fraxineum*, Willd., and found the air-dry powder to retain 8 per cent. of moisture and to yield 11.08 per cent. of ash, one-fifth of which was soluble in water, and three-fourths soluble in hydrochloric acid, a little silica being left undissolved. Treatment with benzin yielded 3.2 per cent. of greenish fixed oil mixed with a crystalline resin, the latter being doubtless identical with that previously observed by Lloyd and by Colton (see Proceedings 1880, 168). Ether now extracted from the powder 4.34 per cent. green acrid resin, and absolute alcohol gave 2.70 per cent. of extract, consisting of resin, a little sugar, tannin, coloring matter precipitated by basic lead acetate, and an alkaloid which was isolated by adding ammonia, agitating with chloroform and evaporating the latter, when yellowish crystals were left. These were soluble in alcohol and chloroform, insoluble in benzin, ether and benzol, had a slightly bitter taste, produced with nitric acid a yellow solution, with sulphuric acid a brown color changing to dark red, and precipitates with the following reagents: Potassio-mercuric iodide, white flocculent; auric chloride, reddish brown and red; platinic chloride, brownish-yellow; picric acid, yellowish; tannic acid, grayish-yellow. The alkaloid is doubtless identical with that obtained by Colton (*loc. cit.*), from Xan. carolinianum, but this is stated to be insoluble in chloroform.

Further treatment of the powder showed the presence of sugar, gum, bitter extractive and albuminoids, and the absence of starch.—Amer. Jour. Pharm., Sept. 1886, 417.

GERANIACEÆ.

Ground Flaxseed—Percentage of Fixed Oil.—Mr. G. M. Beringer observes that the U. S. Pharmacopœia requires that ground flaxseed shall yield not less than 25 per cent. of fixed oil when extracted with disulphide of carbon. A sample recently ground to order yielded thirty per cent. when thus treated, and another lot offered in the market gave thirty-one. This would show that the requirement is not as full as it should be.—Amer. Jour. Pharm., June 1887, 286.

BÜTTNERACEÆ.

Cacao Shells—Proximate Analysis.—Mr. P. S. Clarkson, in view of the absence of a complete analysis of cacao shells in works of reference, has made and communicated the following :

Ash		9.07
Moisture		6.60
Petroleum extract, cacao butter		5.32
Ether extract, resin		.93
Alcohol (absolute) extract; alkaloid .90, coloring matter 4.70		5.60
Distilled water extract; mucilage 5.60, albuminoids .70		6.30
Dilute soda extract, albuminoids		7.00
Total albuminoids by combustion	10.92	
Dilute acid extract, calcium oxalate, etc		6.00
Loss by chlorine, lignin, etc		12.60
Hydrocellulose, etc		14.10
Cellulose		20.92
		95.34
Undetermined matter and loss		4.66
		100.00

—Amer. Jour. Pharm., June 1887, 277–278.

TERNSTRŒMIACEÆ.

Tea—Examination.—Mr. Theodore Waage, whose paper was awarded the Hagen-Bucholz prize for 1885–1886, has studied the different methods proposed for the determination of theine in commercial teas, and has examined 20 different samples of tea. He prefers the method of Mulder for the estimation of the alkaloid—extraction of the tea with boiling water, evaporation to syrup, mixture with magnesia, extraction with anhydrous chloroform, solution of chloroform residue in water, and evaporation of watery solution to constant weight. The author has arrived at the following conclusions:

The percentage of theine does not increase with the quality and price, nevertheless the better sorts are characterized by a high percentage, over 2 per cent., while even in the poorer sorts the quantity does not generally fall below 1 per cent. Good tea contains on the average from 1.6 to 2.6 per cent. of theine. Statements of over 3 per cent. must be accepted with caution. A far better criterion of quality is the quantity of extract obtainable from the sample, the quality of the tea being better in proportion to the larger quantity of extract. This is explained on the ground that young leaves and buds, from which the finer sorts of tea are obtained, yield their extractive more readily than the older, somewhat leathery leaves of the inferior sorts. The examination should embrace the following points:

(1) Botanic-microscopic examination.

(2) Ash, 3–7 per cent., of which 2.5–4.0 per cent. is soluble in water, and not more than 1 per cent. soluble in acids.

(3) Extract, amounting to at least 30 per cent. of the undried tea.

(4) Theine, not below 0.5 per cent., on an average 1.2 per cent.

The amount of extract soluble in water in the 20 sorts examined by the author varied between 32.4 and 44.7 per cent.

Mr. Max Hoffmann, who secured the second prize, also recommends the method of Mulder, slightly modified, for the determination of theine. The majority of 14 samples of tea contained over 1 per cent. theine; the lowest percentage was 0.44, the highest 2.20 per cent.

The third prize was awarded to Mr. Robert Tittelbach, who, after a critical examination of 11 methods for the estimation of theine, also gives to that of Mulder the preference. He has determined the theine and moisture in 41 samples of tea, obtaining as an average of all the samples 1.82 per cent. of theine and 9.33 per cent. of water.—Arch. d. Pharm., May 1887, 443–449.

Tea—Determination of Theine.—Mr. A. Lösch expresses dissatisfaction at the method of Hilger for the estimation of theine (see Proceedings 1886, 436), particularly on the ground that the theine is obtained pure only after recrystallization from alcohol and water, and consequently accompanied by loss. He proposes a method which is essentially that of Mulder (see above), the residue of the chloroform extraction being, however, directly calculated as pure theine.—Arch. d. Pharm., June 1887, 498; from Pharm. Zeitsch. f. Russl, 26, 177.

Japanese Tea—Mode of Preparation and Composition.—Messrs. Kellner, Makino and Ogasawara give some interesting details of the mode of preparation and composition of Japanese tea. They state that the preparation differs from that of Chinese tea, chiefly in that the leaves are not intentionally allowed to ferment, but after moistening and cooling are at once placed in the oven; and also that the tea is not flavored with fragrant flowers. The amount of theine is from 2 to 4 per cent.; of tannin, 17 to 20 per cent. The aqueous decoction contains chiefly tannin, theine and mineral substances.—Pharm. Jour. and Trans., April 9, 1887, 825–826; from Proc. Germ. Naturalists' Soc., for Easterm Asia.

Wine—Determination of Salicylic Acid, which see under "Organic Acids."

Wine—Detection of Fuchsine.—According to Mr. Sartori, the presence of fuchsine in wines is determined in the simplest manner by adding 50 cc. of the wine from 1 to 2 cc. of 10 per cent. solution of ammonia, and immersing pieces of white silk and white woolen goods in the liquid for half an hour. In the presence of fuchsine the white goods are dyed more or less red, whilst in its absence the goods remain absolutely white after thorough washing with water. The amount of fuchsine may be approximately determined by immersing pieces of the goods in the same quantity of solutions of fuchsine containing respectively 1, 2, 3, etc., milligrams per liter, and comparing the resultant colors with that produced by the wine.—Arch. d. Pharm., Jan. 1887, 90; from Ann. di Chim. e. di Farmacol., October 1886, 229.

I. Holtermann do Rego, as well as I. Herz, communicates several methods for determining coal-tar colors in wines, for which see Ibid., 86; from Rep. f. Anal. Chem., 86, 503–505 and 650.

VITACEÆ.

Vitis Vinifera, L.—*Organic Constituents of Different Parts of the Plant.*—Messrs. A. Hilger and L. Gross have examined the organic constituents of different parts of the grape-vine. The sap exuding from cut vines contains sugar, inosit, a mucilaginous body, succinic acid, tartrates and citrates. The young shoots and leaves contain potassium bitartrate, calcium tartrate, tartaric and malic acids, quercetin, tannin, starch, gum, glucose, saccharose, inosit, oxalic and glycolic acids, an ether-soluble substance, ammonium salts, and calcium sulphate and phosphate; in autumn malic acid and inosit are absent. The tendrils contain, besides much pectin compound, sugar, potassium bitartrate and calcium oxalate. The fruit contains tartaric and malic acid, free and combined with potassium and calcium, tannic, succinic, glyoxylic and glycolic acids, inosit, dextrose, levulose, albuminoids, and traces of quercitrin and quercetin.—Landw. Vers. Stat., 1886, 170–196.

Old Wines—Relative Quantity of Glycerin to Alcohol.—Mr. J. Moritz, has subjected some very old wines—some of them of the vintages of 1748 and 1783—and has obtained results that show a large relative amount of glycerin, extractive and acids, while the alcohol appears relatively small in quantity. The proportion of glycerin to the alcohol in eleven samples was as 12.42, 11.77, 32.5, 9.52, 13.0, 11.4, 19.0, 19.66, 25.7, 15.3, and 10.7, respectively to 100 parts of alcohol. The results prove that the commonly accepted maximum of glycerin in pure wines = 14 glycerin to 100 alcohol—is not infrequently exceeded. The detailed results are given in the form of a table.—Arch. d. Pharm., January 1887, 84–86; from Chem. Ztg., 86, 1370.

Wine—Determination of Extractive.—Bouillon draws attention to the necessity of employing evaporating vessels of equal size and shape in making comparative determinations of the extractive in different wines, also that the same volume of wine should be used in each experiment. When making determinations in capsules differing largely in their diameters, he had obtained with the same wine results varying to the extent of

3 grams.—Arch. d. Pharm., Dec. 1886, 1035; Jour. de Pharm. et de Chim., 1886, xiv., 358.

Wine—Detection of Fuchsine.—Dr. Ch. O. Curtman finds that wine slightly colored with fuchsine will produce the isonitril reaction employed by G. W. Hofmann for the detection of chloroform, the conditions being in this case simply reversed. 4 cc. of the wine are mixed with 2 drops of chloroform and 4 cc. of solution of potassa and heated moderately for one minute, when the penetrant and characteristic odor of isonitril will be evident in the presence of mere traces of the aniline derivative.—Pharm. Rundschau, 1886, 271.

MALPIGHIACEÆ.

Aesculus Hippocastanum, L.—*Use of the Leaves and Seeds.*—At the meeting of the Pennsylvania Pharmaceutical Association in 1886, Mr. Geo. W. Stoeckel referred to the use of the leaves and seeds of *Aesculus Hippocastanum*, L., the former as a remedy in the treatment of whooping-cough, the latter for the treatment of hæmorrhoids. He, more recently, states that use of the leaves and seeds in the manner indicated below is not uncommon in the southeastern counties of Pennsylvania. A decoction of the leaves is regarded as a remedy in whooping-cough, and is given in small doses frequently repeated, while the bruised fresh leaves, sometimes mixed with lard, are at the same time employed externally. The entire seed is carried in the pocket as a kind of charm against piles, and the powdered white kernel is thoroughly triturated with lard into an ointment, which is said to be successfully applied against piles. The only mention in text-books of the use of the leaves and seeds for these purposes is found in "National Dispensatory," 3d and 4th Ed., 765.—Amer. Jour. Pharm., March 1887, 152.

ERYTHROXYLACEÆ.

Coca—Characteristic Structure of the Leaf.—Prof. Jos. Schrenk observes that on the lower surface of the coca leaf two curved lines are noticed on both sides of the midrib, running from the pointed lower end of the leaf to its apex. These lines form one of the most important characteristics of the drug, and are mentioned in the descriptions of various authors as "folds of the blade," while Dr. T. E. Hanauseck (Pharm. Rundschau, April 1885) designates them as "tissue folds." Prof. Schrenk says that a close examination will soon lead to the conclusion that the lines in question cannot be considered "tissue folds" or "folds of the blade." The surface view of the epidermis shows that the line is formed by a narrow band of tissue consisting of several rows of elongated, oblong cells which contrast very much with the polygonal cells of the epidermis bordering on the line; the latter cells being extended into peculiar papillary projections. A cross-section through the line plainly demonstrates that the entire ridge is simply a sub-epidermal strand of *collenchyma* cells. There is no "fold" in the epidermis, nor in the spongy parenchyma or palisade layer, nor is there any connection between the line and the fibro-vascular system (the veins) of the leaf. There is little doubt that this band of collenchyma serves as an elastic stiffening of the blade.—Amer. Drugg., April 1887, 61.

Erythroxylum pulchrum, St. Hil.—*Percentage of Cocaine in the Leaves, etc.*—Mr. Theodore Peckolt has experimented with the leaves and bark of this Brazilian species of *Erythroxylum*, which abounds in the mountainous neighborhood of Rio de Janeiro. From the fresh leaves he obtained a very small percentage (0.005 per cent.) of cocaine, together with a strongly bitter extractive (0.03 per cent.), and a crystallizable acid (0.004 per cent.) The bark has also been subjected to partial examination, but the author's experiments are not yet completed.—Pharm. Rundschau, 1887, 247–248.

PAPAVERACEÆ.

Opium—U. S. P. Process of Assay.—Prof. T. J. Wrampelmeier and Mr. G. Meinert have studied the defects in the U. S. P. process for assaying opium, and communicate the following conclusions as the result of their labors:

1. The increase in volume by solution of extractive matter is not sufficient to warrant us in taking 52 cc. of the filtrate as representing 5 gm. of opium (as had been recommended by Mr. Conroy in a paper read before the Liverpool Chemists' Association, December 4, 1884). The volume directed by the U. S. P. (50 cc.) seems to be very nearly correct. At least it would require a large number of experiments to warrant us in changing that.
2. About 10 per cent. of the morphine in the opium is retained in the mother liquor after crystallizing the morphine according to the U. S. P.
3. Excess of either ammonium chloride or free ammonia increases the solubility of morphine in the mother liquor, and experiments should be made with a view to reducing the amounts of ammonium chloride and of lime.
4. The mixture of opium, lime and water should *not* be allowed to stand in an open mortar, but might be made in a mortar if necessary, and transferred to a stoppered flask or covered vessel of some kind to macerate.
5. The filtrate should *not* be measured in a bottle or flask, as directed by the U. S. P., but in a narrow graduated cylinder.—Proc. Mich. Pharm. Assoc., Oct., 1886.

Opium—Method of Assay.—Messrs. Adrian and Gallois, in order to obtain a liquid extraction of the opium bearing an absolutely definite relation to the opium under examination, first determine the amount of insoluble residue in the sample as follows: 5 grams of the opium, in its moist condition, are triturated with 50 grams of 70 per cent. alcohol, macerated for 12 hours, then transferred to a tared filter, exhausted completely with alcohol of the same strength, the residue on the filter dried and weighed. Having ascertained the quantity of this residue, the amount of solvent necessary to make exactly 250 grams of solvent, including the soluble matter from 50 grams of the same opium, is readily calculated. The 50 grams of opium are placed into a tared, glass-stoppered flask, the calculated quantity of 70 per cent. alcohol is added, and the mixture is exposed to a temperature of 25 to 30°, with frequent agitation, until the opium is perfectly disintegrated, and then allowed to cool for 12 hours. The loss, if any, by evaporation is then readjusted by the addition of alcohol, the liquid is filtered, and a weighed portion (say 200 grams, representing exactly 40 grams of the opium) precipitated completely by ammonia. The precipitate after 36 hours is washed with 40 per cent. alcohol, dried, washed with chloroform, again dried and weighed.—Arch. d. Pharm., April 1887, 364; from Jour. de Pharm. et de Chim., 1887, xv., 193.

Opium—Sources of Error in Flückiger's Process of Assay.—Mr. E. Dieterich has found that the yield of morphine from opium by Flückiger's process of assay (see Proceedings 1882, 229), may vary considerably according to the frequency of shaking the mixture of the opium solution, alcohol, ether and ammonia, and that this variation may amount up to 3 per cent. He finds that by the addition of the ammonia the bimeconate of lime present in the opium is decomposed, and contaminates the precipitate of morphine to a greater or less extent; the amount of lime salt precipitated being larger when the shaking is frequent and vigorous, and smaller when the mixture is simply allowed to stand at rest.—Arch. d. Pharm., Nov. 1886, 933; from Ber. v. d. Naturf. Ver , Berlin.

Opium—Methods of Assay.—Mr. O. Schlickum criticises the different methods in use for the determination of morphine in opium. He has found that recently proposed by E. Dieterich to give the most reliable results, and now recommends a modification of that method which will be found under "Morphine" in this report. The author's original paper, which is quite lengthy, will be consulted with interest in Arch. d. Pharm., Jan. 1887, 13–32.

Opium—Estimation of Morphine.—Which see under "Organic Chemistry."

Opium—Relative Extractive Power of Water and of Alcohols of Different Strengths.—See *Tincture of Opium*, under "Pharmacy."

Chelidonium Majus.—Identity of its acid constituent, *chelidonic acid*, with *ferric acid*, which see under "Organic Chemistry."

CRUCIFERÆ.

Mustard—Examination of the Commercial Powder.—Prof. Trimble reports an examination by Mr. R. C. Werner of five samples of *ground mustard* (Sinapis alba). No. 1, the purity of which I can vouch for, yielded 6.00 per cent. of ash, and was free from starch. No. 2, 5.00 per cent.; No. 3, 4.50 per cent.; No. 4, 4.25 per cent.; No. 5, 5.25 per cent. of ash.

Each of the last four gave abundant evidence of starch. As that was the only adulteration found, the ash might reasonably be taken as an index of the amount of it, in which case we would have about the following:

No. 1.	Pure.			
No. 2.	Mustard	83 parts.	Starch	17 parts.
No. 3.	Mustard	75 parts.	Starch	25 parts.
No. 4.	Mustard	70 parts.	Starch	30 parts.
No. 5.	Mustard	87.8 parts.	Starch	12.5 parts.

Nos. 2 and 3 were obtained from grocers; Nos. 4 and 5 from pharmacists.—Amer. Jour. Pharm., June 1887, 279.

CARYOPHYLLACEÆ.

Saponaria Officinalis, Lin.—*Occurrence of Soluble Starch.*—Dr. J. Dufour has observed the occurrence of soluble starch in the epidermal cells of the leaves, stems and floral organs—with the exception of the claws of the petals—of *Saponaria officinalis*, L. This "soluble starch," which has been also detected in a number of other plants, both monocotyledons and dicotyledons, is not a tannin as supposed by Kraus, nor an albuminoid as suggested by Nägeli; neither is it a carbohydrate analogous to ordinary starch. It is soluble in water and in alcohol, less soluble in absolute alcohol, and with difficulty only in ether, benzol and chloroform. It is rapidly extracted by acids and alkalies, crystallizes in yellowish sphaero-crystals, and forms with water blue acicular crystals and an amorphous compound.—Jour. Roy. Micr. Soc., 1886, 819: Amer. Jour. Pharm., Feb. 1887, 73.

SAXIFRAGACEÆ.

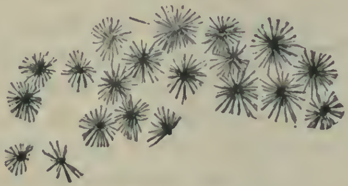
Heuchera—Astringent Qualities of Different Species.—F. W. Anderson states that the roots of *Heuchera hispida*, Pursh, *H. cylindrica*, Douglas, and *H. parvifolia*, Nuttall, are much used in the west by hunters, prospectors and others as astringents, particularly in cases of troublesome diarrhœa caused by the drinking of water in alkali regions. *H. parvifolia* is the commonest species in northern Montana. Of milder and somewhat slower action is the root of

Mitella Pentandra, Hooker, which contains also a bitter principle, and is not likely to cause sudden constipation like the heucheras.—Botan. Gaz., 1887, 65.

Hydrangea Arborescens—Occurrence of a Glucoside, etc.—Mr. C. S. Bondurant has subjected *Hydrangea arborescens* (the root? Rep.) to proximate examination. He failed to find the alkaloid described by Mr. Jacob Baur (see Proceedings 1881, 205), but found the crystalline compound to be a glucoside which he proposes to name

Hydrangin.—The glucosidal characters of this compound are well established. It crystallizes in stellate clusters, which are shown by the accompanying cut (Fig. 19) in their natural size. On addition of an alkali to the aqueous solution, a very distinct and strong opal blue fluorescence is observed, which is destroyed in acidifying. This characteristic fluorescent property was noticed in all the solvents used in exhausting the drug except the petroleum spirit and dilute hydrochloric acid. From its fluorescent property it was thought to be similar to or identical with æsculin, a glucoside prepared from horse-chestnut, but on comparison they were found to be distinct bodies. The fluorescence of hydrangin is opal blue, while that of æsculin is sky blue. Hydrangin also differs from æsculin by its ready solubility in ether, its insolubility in strong hydrochloric acid, and by its not being precipitated by argentic nitrate, mercuric chloride, nor neutral lead acetate. Hydrangin is not charred by concentrated sulphuric acid, but dissolves without color; also with nitric acid. A characteristic reaction for hydrangin is obtained on dissolving it in sulphuric acid and adding a small crystal of potassium bichromate, when a dark purple color is produced, which after some minutes fades to violet; and on addition of a few drops of water an olive green is produced which gradually fades. Hydrangin melts at 235° C., and on increasing the temperature slightly, sublimes without decomposition, forming in stellate clusters without color. Contrary to the statement of Mr. Baur, tannin was not found. The results of the author's analysis are summarized as follows:

FIG. 19.



Crystals of Hydrangin.

Petroleum spirit (fixed and vol. oil)	2.28	per cent.
Stronger ether (glucoside and resin)	1.57	"
Absolute alcohol (glucoside and two resins)	2.31	"
Distilled water (mucilage, saponin and sugar)	9.52	"

Dilute soda (mucilage and albuminoids)	8.37	per cent.
Dilute hydrochloric acid (calcium oxalate)	1.40	"
Starch	7.28	"
Lignin	4.83	"
Ash	3.41	"
Cellulose, moisture, etc., undetermined	59.03	"
Total	100.00	

—Amer. Jour. Pharm., March, 1887, 122–124.

HAMAMELIADEÆ.

Hamamelis Virginica, Lin.—*Proximate Examination of the Bark.*—Mr. Walter B. Cheney has examined witch-hazel bark with the following results: The yield of ash was 6.16 per cent., composed of sulphate, chloride, phosphate, and carbonate of potassium, sodium and magnesium, manganese and silica. The air-dry powder contained 9.75 per cent. of moisture, and yielded 1.15 per cent. of benzin extract, which was also soluble in ether, absolute alcohol, benzol, chloroform, and oil of turpentine, and consisted mainly of wax saponifiable by alcoholic solution of soda. The powdered bark now gave with ether 7.65 per cent. of hard greenish extract, of which nearly two-thirds was soluble in water, this portion containing tannin, but no alkaloid or glucoside; the remaining resin was soluble in alcohol. Absolute alcohol extracted from the remaining powder 6.4 per cent. of soluble matter, fully two-thirds of which was soluble in water, and the remainder in ammonia; tannin and a little sugar were found to be present, but no indication of the presence of an alkaloid or other crystalline principle was obtained. The watery extract amounted to 5.74 per cent., of which 1.2 per cent. was glucose, besides mucilage and other principles. Soda solution extracted 1.75 per cent., including .25 per cent. of albuminoids, and dilute acid took up 4. per cent., leaving half its weight of ash. The bleached cellulose weighed 57.61 per cent. The total amount of sugar, determined by Fehling's solution, was 1.4 per cent., and the tannin, weighed as gelatin precipitate, was 6.75 per cent.—Amer. Jour. Pharm., Sept. 1886, 418–419.

CUCURBITACEÆ.

Cucumis Myriocarpus, Oliver—*Medicinal Action of the Fruit Pulp.*—This plant is known in southern Africa as "cacur." The medicinal part is the fruit, which is yellow, sub-globose, about the size of a large gooseberry, somewhat soft-prickly, weighs from 60 to 100 grains, and contains numerous seeds. The pulp has a faint cucumber-like odor and a decidedly bitter taste, is soft and viscid, and becomes more fluid on being warmed. The Kaffirs use the green fruit as an emetic, heating it first and then squirting the pulp of two fruits into the mouth, when emesis occurs in about fifteen minutes. The rind of the fruit and the testa of the seed are slightly bitter; the embryo is tasteless. Dr. G. Armstrong Atkinson found the pulp to act as a cholagogue purgative when given in non-emetic doses. Its emetic action appears to be local, and to be followed by purgation in case a sufficient amount of the pulp had been retained.—Amer. Jour. Pharm., Dec. 1886, 614; from Edinb. Med. Jour., July 1886.

Elaterium—Improved Method of Assay.—Messrs. H. W. Jones and F. Ransom, in a paper read before the Br. Pharm. Conference, 1886, criticise the method of the B. P. for its assay unfavorably, record a number of experiments made to improve the same, and finally recommend the following detailed method as being reliable:

Macerate 1 gram of finely powdered elaterium with chloroform in a covered dish for a few hours, transfer to a miniature glass percolator (*e. g.* the barrel of a small glass syringe) plugged with wool, and wash with chloroform, allowing about 10 cc. to pass through the marc after the menstruum has begun to pass in a colorless condition. Place the percolate in a small dish, and evaporate off the chloroform at a gentle heat. Treat the residue with a small quantity of pure, absolute ether, and transfer to a small percolator or funnel, plugged with cotton-wool. Wash with pure ether until at least 10 cc. have passed through colorless, and reserve the ethereal washings. Re-dissolve the elaterin, so obtained, by passing chloroform through it whilst still in the funnel or percolator, and evaporate the chloroformic solution once more to dryness in a small dish. Treat the residue so obtained with ether, exactly as before. Allow the united ethereal washings to evaporate spontaneously until the bulk is reduced to about 3 cc. Transfer to a small cylinder (*e. g.* a 10 cc. measure), and allow the separated elaterin to deposit. Carefully decant the colored supernatant liquid, add 4 cc. of pure ether to the residue, and again decant after deposition has taken place. Finally dissolve the elaterin in the cylinder with the aid of chloroform, and wash out the larger amount previously collected in the funnel with the same solvent. Unite the chloroformic solutions, evaporate in a tared dish, dry on the water-bath, and weigh. In a trial experiment the authors found elaterium recovered from the ether-washings equal to 1.9 per cent. A small amount is retained by the final small bulk of ether; this the authors found to be about 7 milligrams, and a correction of about 0.7 per cent. may be therefore made.—Yearbook of Pharm., 1886, 442–446.

Pumpkin Seed—Composition of Ash., etc.—According to Mr. John G. Marburg the ash of pumpkin seeds amounts to 3.7 per cent. of the air-dry material. Water dissolved from the ash 57.03 per cent., diluted hydrochloric acid 39.59 per cent., and caustic soda 2.03 per cent., leaving 1.35 per cent. of insoluble residue. The ash consisted of carbonate, phosphate and chloride of potassium, sodium, calcium, magnesium and iron, and silica.

The seeds were found to be free from starch, and yielded 35 per cent. of a reddish fixed oil extracted by benzol, and 3.05 per cent. of alcoholic extract.—Amer. Jour. Pharm., Feb. 1887, 68.

Bryonia Root—Proximate Examination.—Mr. Chas. F. Heller has made the following determinations with a specimen of the root containing 7.5 per cent of moisture: It yielded 5.5 per cent. of ash, consisting of sulphate, chloride and carbonate of potassium, sodium, calcium, magnesium and aluminium. The benzol extract amounted to 0.746 per cent., and consisted of fixed oil, waxy substance and coloring matter. The alcoholic extract weighed 15.494 per cent., and from it the glucoside bryonin was prepared by the process of Walz. The aqueous extraction contained 9.360 per cent. of solid matter, consisting mainly of sugar, gum and albumen. On continued boiling with diluted sulphuric acid starch was the chief principle taken up, the extract weighing 49.024 per cent. Caustic soda now dissolved 6.1 per cent., and the residuary cellulose, after bleaching and drying, weighed 6.506 per cent.—Amer. Jour. Pharm., Feb. 1887, 68.

Cacur—A Kaffir Emetic.—Mr. G. Armstrong Atkinson observes that one of the most frequently employed of the many emetics used by the Kaffirs of South Africa, is a green or yellowish-green fruit known as *Cacur*, *Cacuo*, or *Small bitter apple*. The author received a small supply of this together with leaves and stalks from Mr. J. A. B. Bayley. The fruit is a pepo, is caducous, quite yellow when ripe, but is used by the natives in the unripe condition. They heat the fruit, squirt the contents into the mouth, and emesis is produced about fifteen minutes after swallowing. The author believed that the fruit was derived from a plant of the order *Cucurbitaceæ*, and this opinion was confirmed by Professor Oliver, of Kew, who believes it to be derived from *Cucumis myriocarpus* (Naudin), a green annual, referred to in "Flora Capensis," II., 495 (Harvey and Sonder). Mr. Bayley states that it grows throughout Cape Colony and the Free State generally. The plant produces fruit very abundantly; the pepo is subglobose, about the size of a large gooseberry (weighing from 60 to 100 grains), and is beset with short and soft prickles. A section shows three parietal placentæ, numerous seeds imbedded in a soft viscid pulp, which becomes more fluid when warmed. The pulp is bitter and has a faint odor of cucumber. The rind is soft, but peels off with difficulty, the seeds are exalbuminous, and the testa, like the rind, is slightly bitter. To determine its therapeutic action the author experimented with the pulp upon himself and upon a large dog, and concludes that it is an emetic and cholagogue purgative; purgative in non-emetic doses, and in doses sufficient to produce emesis causing purgation if sufficient of the drug has been retained. Its emetic action is probably local. The quantity of the drug at his command was too small to permit the author to make an exhaustive chemical analysis of it, but he has ascertained that it does not contain an alkaloid, but a bitter principle upon which its activity depends. He hopes to complete this part of the investigation at some future time.—Chem. and Drugg., July 17, 1887, 73; from Edin. Med. Jour.

PAPAVERACEÆ.

Eschscholtzia Californica—Sedative Effect.—Mr. Stanislas Martin advises chemists to make a careful investigation of the *Eschscholtzia Californica*, in order to separate the unknown active principles to which it owes its calmative action. The character of the sedative effect following the use of eschscholtzia is said to be superior to that of other papaveraceous plants, such as Sanguinaria canadensis, Papaver album, etc., and, so far as clinical experiments have extended, it seems likely to be preferred to codeine. Martin and Prudhomme will soon enter upon its investigation. In 1844 Walz discovered in this plant sanguinarine and two other alkaloids.—Amer. Jour. Pharm., June 1887, 296; from Bull. Gén. de Thérap., April 30, 1887.

TURNERACEÆ.

Damiana—Proximate Examination.—Mr. F. W. Pantzer has subjected the leaves of *Turnera aphrodisiaca*, Ward, to proximate examination. The air-dry leaves lost in a drying chamber 11 per cent. of moisture and volatile oil, and yielded 9.68 per cent. of ash. Petroleum benzin extracted 7 per cent. of volatile oil, fat, wax and resinous matter. Alcohol of 80 per cent. yielded 20 per cent. of dark green extract, containing tannin, two tasteless resins and extractive. Water dissolved 16 per cent. of mucilaginous and extractive principles, and by distillation with water ½ per cent. of an amber-colored volatile oil was obtained, having a heavy aromatic odor and a warm camphoraceous and bitter taste. Alkaloids and glucosides were not observed.—Amer. Jour. Pharm., Feb. 1887, 69.

MYRTACEÆ.

Eucalyptus—Plantations in Algiers.—Mr. Bertheraud states that more than three millions of eucalyptus trees are now in a flourishing condition in Algiers, and that their expected sanitary influence has been realized. The general health has improved in the marshy districts in which they have been planted, swamp fevers have become less frequent, and the ground is gradually becoming dry. The selection of the proper species adapted to the different soils and altitudes is of great importance.—Arch. de Pharm., Jan. 1887, 88; from Jour. de Pharm. et de Chim., 1886, xiv, 515.

Pomegranate Root-Bark—Agreeable Form of Liquid Extract, which see under "Pharmacy."

SALICARACEÆ.

Henna Leaves, Lawsonia Alba—*Extraction of the Coloring Matter.*—Mr. J. C. S. Thompson makes some general remarks on the use of henna leaves by the Arabs and other Orientals, and mentions the following respecting the extraction of the peculiar brown coloring matter. This coloring matter may be very easily extracted, it being almost entirely soluble in hot water. The leaves should first be reduced to a coarse powder, then macerated for two or three hours in boiling water and strained. Boil the residue in two or three successive quantities of water till thoroughly exhausted, mix, and evaporate the strained liquid. They will be found to yield from 12 to 15 per cent. of a dark-brown gum. This gum is readily soluble in hot water, glycerin, strong solution of potash and ammonia, and dilute acids, but very slightly in ether, chloroform and alcohol. The color of the watery solution is intensified by alkalies and diminished by strong acids. The leaves also yield 2 per cent. of an olive-green resin that is soluble in ether and in alcohol.—Pharm. Jour. and Trans., April 16, 1887, 845–846.

ROSACEÆ.

Wild Cherry Bark—Fluorescent Principle.—Mr. R. Rother having observed that syrup of wild cherry bark occasionally presents a decided bluish fluorescence, and invariably if the menstruum is rendered alkaline with ammonia, has made experiments to determine the character of the principle to which this fluorescence is due. By suitable means, which are given in detail, he succeeded in isolating the principle in question in the form of crystals. These crystals are readily soluble in chloroform, ether and alcohol, and are also soluble in water. The alcoholic and aqueous solutions became strongly fluorescent on the addition of ammonia. The crystals formed in slender branched filaments, upwards to one inch in length. Viewed in oblique incident light, they displayed decided rainbow tints, which may result from prismatic dispersion, but were probably the iridescence of diffraction. Under the microscope with a one-inch power, these crystals showed no prismatic form, although their appearance was very fine. A merely incipient polarescence was observable, which, however, develops with the age of the crystals into an excellent appearance. The proportional quantity of this crystalline constituent of wild cherry bark is exceedingly small. Without the fluorescing property as a guide, it would have been practically impossible to detect and isolate it. Judging from its crystalline form it does not appear to be mandelic acid, a decomposition product of amygdalin. It may, however, be an analogue, or a substituted derivative of it. This conjecture leads to the legitimate question, whether or not it is amygdalin as such, from which the benzoic aldehyde and cyanhydric acid of syrup of wild cherry results.—Amer. Jour. Pharm., June 1887, 286–288.

Quillaia Bark—A Substitute for Senega.—At a meeting of the Society of German Naturalists, held at Strassburg in 1885, Dr. Kobert directed attention to the value of quillaia bark as a medicinal agent, and particularly as a substitute for senega. Prof. F. B. Power now draws attention to the same subject, giving the chemical history of the drug, etc., and communicates a formula for the preparation of a *fluid extract* (which see under Pharmacy), in the hope that the medicinal value of quillaia may be subjected to critical investigation.— Pharm. Rundsch., 1886, 195–196.

Spiraea Filipendula, Lin.—*Use of the Bark in Rabies.*—The tuberous roots of this perennial plant were formerly used in excessive secretion of mucous glands, and over fifty years ago were recommended in hydrophobia. Recently a Polish physician, Dr. F. I. Jagell, stated that he had successfully used the *bark* of this plant in the form of infusion, in 88 cases where persons had been bitten by rabid dogs or wolves, 26 of the patients having already exhibited the early symptoms of hydrophobia.

The root has not been fully analyzed, but is known to contain tannin, sugar and starch, and in the fresh state also a volatile oil, which is probably identical with that of the stem and leaves, this consisting of salicylic aldehyde.—Amer. Jour. Pharm., Feb. 1887, 76.

Neviusia Alabamensis, Gray—*Restricted Distribution.*—Prof. Charles Mohr draws attention to this small monotypical shrub, which is from 3 to 4 feet high, and has so far been found only on the carboniferous sandstone ledges which form the precipitous banks of the Black Warrior river near Tuscaloosa, Alabama. This singular plant, which was originally discovered by Dr. Nevius, is characterized, and distinguished from the nearly related genus Spireæ, by the absence of floral petals. In its individual characters it approaches nearer to the genera Neillia, Spiraea, Astilbe, Stephanandra, belonging to the group Spiraea, and on the other hand to the genera Dalibardia, Fragaria and Rubus, belonging to the Potentilleæ. Prof. Gray, however, believes that its nearer related genera must be sought in the Japanese flora, that they will be found in the genera Rhodotypus and Kerria, and that it must be brought with Rhodotypus as a new genus into the sub-division of the Dalibardieæ.—Pharm. Rundschau, 1887, 9.

LEGUMINOSÆ.

Cassia Alata, L.—*Use in Ringworm.*—The leaves of this plant are recommended by Conillebault (Thèse, Paris, 1886) for giving prompt relief in ringworm; they are moistened with water and the affected parts are then rubbed; or, an acetic extract of the leaves may be used. In this connection Prof. J. M. Maisch remarks that in India the plant is regarded as a cure for poisonous bites and for venereal eruptions, and the leaves have long been used for curing ringworm. Lindley describes the leaves as being 2 feet long, abruptly pinnate. Leaflets opposite, from 8 to 14 pairs, the exterior largest, linear-oblong, obtuse or emarginate, with a point, smooth, entire, veined; 3 to 6 inches long, 2 to 2½ inches broad; the lower pair somewhat distant, nearly round and reflexed back on the stem or branches. Petioles channelled, the channel large and formed by two thin firm yellow borders. There is a cross-bar between each pair of leaflets, covered with small dark-colored bristles, and there is no other gland. Stipules auriculate, rigid, pointed, persistent, appearing like prickles. The plant is shrubby like Cassia Sophora, Lin., the leaves of which are similarly employed. Cassia Tora, Lin., an annual of Southern Asia, is reputed to have similar antiherpetic properties; likewise Cassia occidentalis, Lin., which is common throughout the tropics, has been naturalized in the Southern United States as far north as Virginia, and is known in some localities as *styptic weed.*—Amer. Jour. Pharm., May 1887, 266.

Glycyrrhiza glabra, Lin., and *G. glabra*, var. *glandulifera*, Reg. et Herd.—Mr. J. E. T. Aitchison observes that this shrub in one form or other is common all over Badghis, and throughout the Harirúd and Khorasán districts, Afghanistan, near water. The Turkomans prepare from its roots the extract of licorice, which as well as the shrub they call *mahk.* Licorice is not manufactured at Meshad, but the author has information that it is imported from Tezd and Fars in Persia, as well as from Turkistan. The Turkomans also make a preparation by boiling the extract down in whey, which they call *Ao-karût*, and which has a saline flavor making the licorice more palatable.—Pharm. Jour. and Trans., Dec. 11, 1886, 467.

Licorice—Cultivation in California.—A farmer in California, who is extensively engaged in the cultivation of licorice, writes as follows to the "Crescent City Drug and Trade Review:"—The licorice plant is hardy and easy to raise, and when you once get it started it is there for all time. It will grow on almost any kind of soil, but will give the best result on low, moist land. If it is overflowed even for a month at a time it will do no harm; and, once it is fairly started, stock can not injure it. It is cultivated as corn, planted in drills, in rows four feet apart, and, once started, all the cuttings needed can be easily raised. The best time to transplant the root is from Christmas to April, and the crop can be gathered any time from October to March; when gathered, it should be put on high dry ground in piles, and turned over several times, but must in drying be kept from frosts, as that injures the delicate flavor of the root. Cold weather, while the plant is still in the ground, does not injure it, as is shown by the fact that it has grown where the temperature has been as low as 25° below zero. Where frosts prevail after the gathering, it should be dried slowly under sheds.—Nat. Drugg., Dec. 31, 1886, 317.

Sophora Speciosa, Benth.—*Proximate Examination of the Seeds.*—In 1878 (see Proceedings 1878, 608–609), Dr. H. C. Wood isolated a poisonous alkaloid, *sophorine*, from the seeds of *Sophora speciosa*, Benth., an evergreen shrub, indigenous to Texas and New Mexico. Messrs. Moritz Kalteyer and Wm. E. Neil have now separately subjected the seeds to proximate examination, and found the alkaloid both in the testa and in the kernel. Mr. Neil, who appears to have added the layer of albumen to the embryo, obtained the following results:

	Testa.	Kernel.
Extracted by petroleum benzin	5.60	18.200 per cent.
" " ether	lost	.153 "
" " absolute alcohol	1.26	1.860 "
" " distilled water	12.00	26.500 "

The alkaloid was found in the alcoholic extracts; slight traces of it were also observed in the other extracts from the kernel. The specific gravity of the yellowish red fixed oil, obtained by benzin from the kernel, was determined to be .889; it was insoluble in alcohol, but freely soluble in ether, chloroform and carbon bisulphide. The presence of sugar was determined by Fehling's solution in the water extracts. As far as examined, the other constituents agree with those of Mr. Kalteyer, who appears to have added the layer of albumen to the testa. These are as follows:

	Percentage from	
	Testa.	Kernel.
By *petroleum spirit*: Saponifiable fixed oil, sp. gr., .912	1.300	21.050
By *ether* (resin or wax)	.100	trace.
By *alcohol*: Phlobaphene	1.000	2.610
Alkaloid, organic acids (tannin in testa) and other organic substances	2.350	7.540
By *water*: Inorganic salts	1.000	2.300
Mucilage	4.150	1.500
Albumin	——	1.750
Dextrin	1.900	2.200
Organic acid and coloring matter	6.900	6.000
Soluble Arabic acid?	1.050	6.573
By *caustic soda*: Mucilage and Albuminoids	1.200	9.070
Not precipitated by acetic acid and alcohol	3.700	4.250
By *hydrochloric acid*: Parabin	3.750	6.450
Lignin	6.876	4.380
Insoluble residue	55.084	14.945
Moisture	9.575	7.500

The abstract of the author's paper is accompanied by a cut, showing a flowering branch, fruit, seeds and embryo of the plant, and the following description: The trunk is tough, crooked and rough, with a gray-brown thin bark, and with hard and heavy yellow wood, which in some

FIG. 20.

Sophora Speciosa.

localities is called *lignum vitæ*. The leaves are impari-pinnate; the leaflets in 3 to 5 pairs, about 1½ inch long, obovate or oblanceolate, obtuse or emarginate, entire, reticulate, dark-green and glossy above, and paler beneath. The showy flowers appear in February and March, grow in racemes, and have a blue-purple papilionaceous corolla, ten distinct stamens, and a strong fragrant odor. The fruit is indehiscent, more or less moniliform, often curved, grayish-pubescent, and contains from 1 to 8 seeds. The seeds are roundish-ovate, about ½ inch long and ⅜ inch thick; the testa is hard, brittle, somewhat granular, dark-red or sometimes yellowish, and marked from the slightly flattened hilum by a longitudinal ridge. It contains a thin layer of firm whitish albumen, and an embryo of the shape of the seed, with two white, rather concavo-convex cotyledons, and a short radicle bent at a right angle. The average weight of the seed is 20 grains, that of the kernel about 12 grains, and of the integuments 8 grains. The seed is inodorous, and the taste bean-like and somewhat bitter.—Amer. Jour. Pharm., Oct. 1886, 465–468.

Astragalus—Afghan Species.—Mr. J. E. T. Aitchison draws attention to two Afghan species of *Astragalus: A. heratensis*, Bunge, and a species nearly related to *A. strobiliferus*, Royle, which are very common in the strong soil of the Harirúd Valley and Khorasán, at an altitude of 3000 feet. The native name for the gum, which is collected from them in large quantities in Khorasán for exportation to India *via* Herat, and to the sea coast of Persia, is *Katira.* The author found the gum attached to the stem in the peculiar form of tragacanth wherever it had been able to make its way through fissures in the bark, and on cutting the stem across the gum was seen to protrude from the medullary space.—Pharm. Jour. and Trans., Dec. 11, 1886, 467.

Butea Frondosa, Roxburgh.—*Analysis of the Seeds.*—Mr. Nikolai Waeber has analyzed the seeds of *Butea frondosa*, Roxburgh. They are flat, about $\frac{1}{2}$ inch long, 1 inch broad, and $\frac{1}{10}$ inch thick; testa dark reddish brown, veined; hilum projecting; cotyledons broad, leafy, veined; radicle small; taste somewhat bitter. Alkaloids and glucosides were not found. The results of the analysis were: moisture, 6.62; ash, 5.14; fat, 18.20; wax soluble in ether, 0.25; albuminoids soluble in water, 9.12, soluble in soda, 1.95, and insoluble in water and soda, 8.49; substance apparently nitrogenated, soluble in alcohol, 0.82; mucilage, 2.28; glucose, 6.87; organic acids, 4.00; other substances soluble in water, 2.16; metarabic acid and phlobaphen 10.10; cellulose, 3.80, and other insoluble substance, 22.20 per cent.—Pharm. Zeitsch. f. Russl., 1886.

Ulex Europæus—Isolation and Characters of a new base, Ulexine, which see under "Organic Chemistry."

Guilandina Bonduc, Linné.—*Isolation and Characters of Bitter Principle.*—From the cotyledons of the yellow seeds of this tree, Messrs. Heckel and Schlagdenhauffen have isolated the bitter principle in the form of a white powder which is nearly insoluble in water and petroleum benzin, sparingly soluble in ether and carbon bisulphide, and freely soluble in alcohol, acetone, chloroform and glacial acetic acid. Sulphuric acid colors it brown and afterward purplish red; hydrochloric acid produces a rose color, and nitric acid forms with it a red resin. It has been found efficient by Dr. Isnard in intermittent fever, in doses of 0.1 to 0.2 gm.—Amer. Jour. Pharm., Dec. 1886, 613; from Compt. Rend., ciii, 89.

Robinia Pseudacacia, L.—*Poisoning by the Bark.*— Dr. Z. J. Emery draws attention to the poisoning of thirty-two boys at the Brooklyn Orphan Asylum from chewing the inner bark of the locust-tree, which they had obtained from the yard where fence-posts had been stripped. In the mildest cases vomiting of ropy mucus was observed, together with flushed face, dryness of throat and dilated pupils. In the severest cases large quantities of ropy mucus mixed with blood were vomited; the other symptoms were retching, pain in the epigastrium, debility, stupor, extremities cold and pulseless, heart's action feeble and intermittent, pupils dilated, faces of a dusky pallor. These patients were given bismuth subcarbonate and brandy by the mouth, and morphine hypodermically; sinapisms were applied over the stomach, and bottles with hot water along the extremities. The patients were discharged from the hospital in two days.

The stem bark has never been examined chemically. Asparagin has been found in the root, and the flowers contain the glucoside robinin, which yields quercetin. The bark deserves investigation in view of the fact that a number of woody leguminous plants are known to contain poisonous alkaloids and other more or less active principles.—N. Y. Med. Jour., Jan. 22, 1887; Amer. Jour. Pharm., March 1887, 153.

Wistaria Chinensis, Lin.—*Isolation and Characters of a Poisonous Glucoside.*—Mr. Ottow has isolated a poisonous glucoside from the bark of *Wistaria Chinensis*, L., which he has named

Wistarin.—It is freely soluble in alcoholic liquids, sparingly soluble in ether, chloroform and cold water, is colored violet and green-brown by ferric chloride, and dissolves in alkalies and alkali carbonates with a yellow color, and in sulphuric acid with a yellow color changing to cherry red. Wistarin has a bitter and astringent taste, melts at 204° C., is not precipitated by tannin, yields a white precipitate with basic lead acetate and a green one with copper sulphate, and on being boiled with dilute sulphuric acid is decomposed into sugar, a crystalline resin, and a volatile oil having the odor of menyanthol; this oil, when treated with warm potassa solution, is converted into a white compound of a coumarin-like odor. The bark contains also a resin having apparently toxic properties. —Nieuw Tijdschr., 1886, 207; Amer. Jour. Pharm., Feb. 1887, 76.

Gymnocladus Canadensis, Lamarck—*Proximate Examination of the Seeds.*—Mr. Samuel S. Mell observed that the seeds of *Gymnocladus canadensis*, Lamarck, weigh on the average 30 grains, contain 8.5 per cent. of moisture, and yield 2.75 per cent. of ash. Petroleum benzin extracts about 10 per cent. of fixed oil, which is yellowish, saponifiable, and of the spec. grav. .919. Ether extracts a little wax, fat and resin. The alcoholic extract amounts to 3.25 per cent., and contains a little tannin and a small quantity of glucoside, which can be removed from the aqueous solution by chloroform, and which appears to be present also in the immature fruit; it has a peculiar odor and an acrid burning taste. The seeds contain also mucilage, starch and albuminoids.—Amer. Jour. Pharm., May 1887, 230.

Bablah—Proximate Examination.—Mr. V. Wilbuszewitcz has examined this drug, the fruit of *Acacia Bambolah*, Roxb., indigenous to India. He estimated the tannin present with permanganate of potassium, which indicated 12.1242 per cent., the amount agreeing nearly with the weight of tannin isolated. One of the tannins was sparingly soluble in cold water. The reactions of the four varieties of tannin were similar: blue black with ferric salts; black green with ammonium vanadate; copper acetate brown; copper sulphate yellowish to brown; tartar emetic yellowish; acetate of lead yellowish, etc. Gallic acid was also obtained in notable quantities. For oxidation 1.20125 to 1.27127 gm. of the four varieties of tannin required 1 gm. of potassium permanganate. By decomposition with alkalies the tannins yielded protocatechuic acid, and by treatment with dilute sulphuric acid phlobaphene, ellagic acid, and gallic acid were obtained.—Amer. Jour. Pharm., Sept. 1886, 448; from Phar. Zeitschr. f. Russl., 1886.

Cortex Adstringens Brasiliensis—Proximate Examination.—An old sample of this bark, which is derived from *Stryphnodendron Barbatimao*, Martius, has been examined by V. Wilbuszewitcz, who obtained comparatively much phlobaphene and little tannin, the latter being obtained by the process of J. Löwe, by precipitating with sodium chloride, redissolving in water and agitating with acetic acid. By dialysis a small quantity of gallic acid was obtained. The phlobaphene is readily soluble in ammoniacal water, nearly insoluble in cold water, and is not precipitated by gelatin. Three tannins, differing in composition, one of them being slightly soluble in cold water, were obtained; their reactions were similar—brown black with ferric salts; light brown with copper acetate; red brown with copper sulphate; yellow with lead acetate; blue green with ammonium vanadate; tartar emetic, no precipitate, etc. 1 gm. potassium permanganate oxidized 1.329 gm. of one tannin, and 1.305 gm. of another variety. Decomposed with potassa, protocatechuic acid was obtained, but phloroglucin could not be observed. On heating with diluted sulphuric acid in a sealed tube, the tannin was decomposed, yielding phlobaphene, gallic acid, and traces of ellagic acid, but no sugar.—Amer. Jour. Phar., Sept. 1886, 448; from Phar. Zeitschr. f. Russl., 1886.

TEREBINTHACEÆ.

Chian Turpentine—Pharmaceutical Preparations.—Mr. Henry Campbell discusses the pharmacy of Chian turpentine. He regards the emulsion the most suitable form, and gives a method for its preparation from the ethereal tincture, a formula for which, as well as for the emulsion, will be found under the proper heading under "Pharmacy."—Pharm. Jour. and Trans., Dec. 4, 1886, 445.

Juglans Regia, L.—*Histological and Chemical Characters of the Fruit-Shells.*—Mr. C. Hartwich communicates the results of the histological examination of the fruit-shells of *Juglans regia*, L., in a comprehensive paper, his observations being illustrated by numerous cuts. He has also made a micro-chemical examination, and among others has made the interesting observation that the

Juglon, first determined by Mylius, is not contained in the unripe shell as juglon, but as *hydrojuglon*, which is oxidized by the action of ferric chloride into juglon. For the micro-chemical examination, however, it is best to resort to bichromate of potassium, since the black color produced by the ferric compound and the tannin present in the shells interferes with the proper recognition of the crystals. By employing bichromate, the crystals appear well defined, whilst the tannin is precipitated.—The author's paper may be consulted in Arch. d. Pharm., April 1887, 325–335.

Juglans nigra—Proximate Examination of the Leaves.—Miss Lillie J. Martin has communicated to the American Science Association a very exhaustive paper, detailing experiments made to determine the constituents of the black walnut leaves (picked in the month of July). The method followed was based upon "Dragendorff's Plant Analysis," and the result of this preliminary analysis may be briefly summarized as follows:

a. From Ten grams by Hot Extraction.

Moisture	8.45 per cent.
Ash	8.49
Organic Petroleum Spirit Extract	3.50 "
" Ether "	8.50 "
" Absolute Alcohol Extract	9.50 "
" Water "	12.50 "
" Alkaline "	4.80 "
" Acid "	9.50 "
Total	65.64

b. From Fifty grams and Cold Maceration.

Organic Petroleum Spirit Extract	3.00 per cent.
" Ether "	3.66 "
" Absolute Alcohol Extract	8.58 "

Several micro-chemical examinations, which gave similar results, revealed the presence of calcium, magnesium, potassium and iron in combination with sulphuric, hydrochloric, phosphoric, silicic, and carbonic acids, also chlorophyll, volatile oil, a volatile acid, resin, a fat of the higher acid series or a wax, tannin, glucoside, mucilage, organic acids and allied substances, glucose, starch, albuminoids, lignin, and cellulose; of these tannin seems to be the controlling principle in the plant. Oxalic acid, as oxalate of calcium, was also determined. The author lays considerable stress upon the value of a preliminary microchemical examination of any plant taken up for study.—Amer. Jour. Pharm., Oct. 1886, 468–474.

Myrrh—Chemical Examination.—A sample of myrrh examined by Mr. Chas. E. Escott, left 56 per cent. of insoluble matter on treatment with alcohol. Maceration with petroleum benzin yielded a pale yellow liquid, which on spontaneous evaporation left 18.75 per cent. of oily residue. Caustic potassa gave with myrrh a solution of a brilliant red color, turning to amber color on dilution. The gum left on treatment with alcohol had a barely perceptible odor of myrrh and a slightly mucilaginous taste, was neutral to test paper, and though of a pale color, gave with water a dark-brown solution, the odor changing and becoming stronger, without apparent decomposition. The insoluble portion amounted to 15 per cent., or 8.4 per cent. of the weight of the myrrh. The dilute solution (1:450) acquired a purple color by ferric chloride, changed to reddish yellow by ammonia. Stronger solutions were precipitated by alcohol, not gelatinized by borax, and the precipitate with subacetate of lead was not re-dissolved. A castor-oil emulsion made with the gum, proved to be not permanent. The gum makes a good mucilage and should be saved for that purpose in making tincture of myrrh.—Amer. Jour. Phar., Feb. 1887, 68–69.

Rhus Cotinoides, Nuttall—*Restricted Distribution.*—In a former paper to "Pharm. Rundschau" (Jan. 1883, 6), Prof. Charles Mohr had drawn attention to this American representative of the *R. cotinus* of the Mediterranean flora. He now adds that notwithstanding continued efforts to find this magnificent little tree on the more northern slopes of the Cumberland mountains or on the southern plains of the Tennessee Valley, he has utterly failed. The efforts of Prof. Harvey, also, to find this tree on the Grand river, Arkansas, where it was originally discovered by Nuttall, or in any other part of Arkansas, have been equally unsuccessful. The occurrence of the tree is therefore confined, according to the present knowledge of the author, to the limited district in Alabama pointed out by him four years ago.—Pharm. Rundschau, 1887, 8.

Rhus Cotinus—Isolation and Character of a New Yellow Coloring Matter, Fisetin, from the wood. See under "Organic Chemistry."

RHAMNACEÆ.

Rhamnus Purshiana—Diagnostic Distinction of the Bark from that of

R. Frangula.—Prof. Joseph Schrenk observes that the bark of *Rhamnus purshiana* contains numerous sclerenchyma cells of most irregular, angular shape, wedged together so as to form large compact groups, which increase in size and number towards the surface. They cause the short fracture of the outer bark, while the inner is fibrous, the bast cells projecting in narrow tangential bands. As frangula bark has the bast bundles arranged in a similar way, but no sclerenchyma cells, the presence of the latter in "cascara sagrada" is of diagnostic value.—Amer. Drugg., April 1887, 61.

EUPHORBIACEÆ.

Euphorbiaceæ—Examination of the Latex of Different Species.—Mr. G. Henke gives the details of comprehensive experiments to determine the composition of the latex of different species of the *Euphorbiaceæ*, with a view to reconciling, if possible, the conflicting statements respecting the character of euphorbium and allied products that have been made by different investigators. After reviewing concisely the literature on the subject, the author proceeds with the details of his own experiments, the general results of which may properly find place here.

Euphorbia resinifera, Berg.—The latex of this plant constitutes when inspissated the *Euphorbium* of pharmacy. It contains nearly 50 per cent. of impurities as brought into commerce. The pure substance is composed as follows:

Euphorbon, 34.60 per cent.; resin soluble in ether, 26.95 per cent.; resin insoluble in ether, 14.25 per cent.; caoutchouc, 1.10 per cent.; malic acid, 1.50 per cent.; gum and salts, precipitable by alcohol, 8.10 per cent.; gum and salts, not precipitable by alcohol, 12.30 per cent.; salts and organic substances soluble in ammonia, 1.20 per cent.

Euphorbia Cattimandoo, W. Elliot.—From 300 parts of the dried latex the author obtained 92 parts of pure euphorbon = 35 per cent; he obtained, furthermore, 27.40 per cent. resin soluble in ether; 13.70 per cent. resin insoluble in ether; 1.50 per cent. caoutchouc; 1.15 per cent. malic acid; 7.60 per cent. gum and salts precipitable by alcohol; 12.15 per cent. gum and salts not precipitable by alcohol, and 1.50 per cent. salts and organic substance soluble in ammonia.

Euphorbia Tirucalli, L. (Hab. East Africa, principally Zanzibar.)—Euphorbon was obtained in handsome needles, together with 4 per cent. of caoutchouc. The other constituents are analagous to those of the officinal euphorbium, but were not determined quantitatively.

Euphorbia tetragona, Haworth. (Hab. Cape of Good Hope.)—This contains the same constituents as the above, and, like *E. tirucalli*, L., a larger quantity of caoutchouc than officinal euphorbium.

Euphorbia antiquorum, L. (Hab. East Indies.)—This, while having the same constituents as the officinal euphorbium, contains a larger percentage of caoutchouc than any of the euphorbiums examined, viz.: 5.5 per cent.

Besides the above the author has examined the fresh latex of the following seventeen species of *euphorbia:*

E. Lathyris, L.; *E. Myrsinites*, L.; *E. orientalis*, L.; *E. virgata*, Waldstein et Kitaibel; *E. Lagascæ*, Sprengel; *E. humifusa*, Willdenow; *E. splendens*, Bory; *E. canariensis*, L.; *E. trigona*, Haworth; *E. neriifolia*, L.; *E. virosa*, Willdenow; *E. resinifera*, Berg (fresh latex); *E. palustris*, L.; *E. Gerardiana*, Jacquin; *E. verrucosa*, Lamarck; *E. exigua*, L.; and *E. Cyparissias*, L.; the five last-named species having been collected by the author in the neighborhood of Strassburg. All of these varieties were found to contain euphorbon, as well as malic acid, which, in most cases, if not in all, is present in form of calcium salt. Starch is also present in all of the euphorbiums examined, and the same appears to be true for caoutchouc. The author gives a description of the principal characters of *euphorbon*, which he thinks will afford an interesting subject for further investigation, as would also the acid resin, soluble in ether; this latter being indeed the only important constituent from a medicinal point of view. The paper is concluded with a comprehensive bibliography.—Arch. d. Phar., Sept. 1886, 729–759.

Euphorbia Drummondi, Boissier.—*Alkaloidal Constituent and Uses.*—According to Dr. John Reid, this plant, a native of West Australia, possesses valuble anæsthetic properties, and contains an alkaloid which he names

Drumine.—The alkaloid is stated to be prepared by making a tincture of the plant or milk juice with alcohol containing hydrochloric acid, then concentrating by distillation, precipitating by ammonia, and filtering; the residue is dissolved in dilute hydrochloric acid, decolorized by animal charcoal and evaporated, when boat-shaped colorless crystals are obtained. The alkaloid is stated to be almost insoluble in ether, but freely soluble in chloroform; also in water. A 4 per cent. solution of the alkaloid dropped into the eye produced local insensibility without appreciably dilating the pupil. A subcutaneous injection of 3 grains showed no effect in a cat beyond local anæsthesia; but a larger dose by the mouth caused paralysis of the limbs and difficult breathing, and strychnine failed to produce muscular contraction. Applied to the tongue or nostrils, loss of taste was observed, but small doses swallowed were not followed by any perceptible constitutional symptoms. Dr. Reid recommends the alkaloid more particularly in small operations, sprains and local irritation. —Austral. Med. Gaz., Oct. 1886.

Drumine—Non-Anæsthetic Effect.—Dr. A. Ogston has made experiments which demonstrate that drumine has little if any effect as an anæsthetic. Instilled into the conjunctiva it produced no anæsthesia and had no perceptible effect on the pupil. Used hypodermically on four persons in doses of 4 and 6 minims of a 4 per cent. solution, a sharp and aching pain, followed by swelling and tenderness of the spot, was produced, but no anæsthesia. The material employed had been received directly from Dr. Reid.—Brit. Med. Jour., Feb. 26, 1887.

Euphorbia Helioscopia, L.—*Ulceration Reported from its Application as a Poultice.*—This annual is indigenous to Europe and naturalized in some parts of the United States, in fields and waste places, and is characterized by its terminal umbel-like inflorescence, its obovate, finely serrate and more or less wedge-shaped leaves, and its smooth, almost three-lobed fruit, containing coarsely reticulated, brownish seeds. With some botanically-allied species it was formerly employed as a hydragogue cathartic, and is regarded as being less acrid than many other species of the same genus. A case of severe ulceration is reported by Dr. Baudry ("Bull. Méd. du Nord"), resulting from the application of a poultice of the bruised plant. The milk juice is stated to be employed by peasants as a cure for warts.—Amer. Jour. Pharm., May 1887, 264.

Euphorbia Peplis, L.—*Use in Hydrophobia.*—This plant is said to be used as a domestic remedy in hydrophobia, and has been used successfully by Dr. Afonsky ("Russk. Meditz.," 1886), as a preventive, the drug being given in the form of powder after cauterizing the wound with hydrochloric acid, and using also pilocarpine hypodermically. The plant is an annual, has thickish, obliquely oval entire leaves, axillary flowers, and smooth fruits with smooth seeds, and grows in southern Europe. It is used as a carthartic like *Euph. Peplus*, L., which is also an annual, but has roundish, entire and somewhat petiolate leaves, a corymbose inflorescence, the capsule-lobes two-keeled on the back, and grayish pitted seeds; the latter species has established itself in some parts of the United States. —Amer. Jour. Pharm., May 1887, 264–265.

Mandioca—Cultivation and Uses in Brazil, and Chemical Constituents. —Mr. Theodore Peckolt has written a very exhaustive paper on the cultivated mandioca·plants of Brazil, in which he reviews the methods and statistics of their cultivation, the uses to which they are applied, as well as the researches that have been made respecting their chemistry, for all of which reference must be had to the original paper, running through eight numbers of the "Pharmaceutische Rundschau" for 1886 (pp. 57, 81, 107, 147, 171, 201, and 227). Some of the author's original observations may, however, be briefly noted here. While, on the authority of Henry, it has been generally assumed that the bitter variety of mandioca alone possesses poisonous properties, Mr. Peckolt has proved that the sweet mandioca, which is regarded to be innocuous, also contains hydrocyanic acid—or is capable of yielding—the quantity being largest during the flowering period of the plant. The fresh root yielded during the flowering period 0.02436 gram of hydrocyanic acid per kilogram, and when perfectly ripe only 0.008 gram. The quantity of albumen and sugar, also, is highest during the flowering period. The author has furthermore made the observation that the hydrocyanic acid does not exist as such in the roots *while in the ground, but is formed by the action of the air on exposure to the same.* He has not succeeded to isolate amygdalin or any other similarly constituted body. His endeavors to isolate such a body resulted in the separation of a yellow amorphous body, which, when mixed with milk of almonds, developed in the course of an hour a strong palargonium odor. A trace of this substance when placed on the tongue developed a faint acrid taste, produced slight vertigo, and a peculiar oppression of the brain. Besides the two crystalline bodies, *manihotin* and *manihotic acid*, the author has observed three new bodies. The first of these is an oily or glycerin-like body, which possesses the property of preserving albuminoid bodies from change, and which he has in consequence named

Sepsicolytin.—It is a brownish fluid, having a faintly acrid and styptic taste and a peculiar odor. The second substance, which he obtained from the poisonous *Cambaia mandioca*, constitutes a brown, resinous, odorless mass, having a persistent capsicin-like taste, and is therefore named by the author

Manihot capsicon.—It is insoluble in water and in cold alcohol, but soluble in boiling alcohol, in ether, and, by the aid of heat, in alkalies. The third substance, which the author has named

Manihotoxin, was obtained from the latex, which is contained abundantly but separated with difficulty from the roots of the *Cambaia.* It is a crystalline substance, and, to judge from the author's preliminary experiments, highly poisonous. It requires further examination.

The tables appended to the author's paper are of particular interest since they exhibit the results of analyses, the large number of varieties of mandioca plants, the character and size of their starch granules, etc., etc.

Jatropha Multifida—Examination and Uses of the Latex and Seeds.—Mr. Peckolt states that this euphorbiaceous plant, a native of Brazil, finds medicinal application in various ways. An infusion of the seeds, or the fixed oil of the same, in doses of 10–15 drops, is used as a purgative, while the latex obtained by incisions from the plant is a popular vulnerary employed for wounds under the name of "Balsamo." The seeds contain 6 per cent. of glucose, about 1 per cent of a bitter principle, and 30 per cent. of the fixed oil. The latter gradually becomes vermilion red by the action of sulphuric acid. The bitter principle is soluble in water and in ether, but not in alcohol. The latex is precipitated by acids as well as by alkalies, and ferric chloride produces a chestnut-brown precipitate.—Arch. d. Pharm., May 1887, 415; from Rev. Pharm. de Rio de Janeiro, 1886.

Kamala—Proximate Examination.—Messrs. A. G. and W. H. Perkin obtained from kamala—by extraction with bisulphide of carbon, concentration of the extractive on the water bath, resolution of the precipitate separated in the residue in bisulphide of carbon, and recrystallization from toluol or benzol—a compound which they have named

Mallotoxin (from *Mallotus Philippinensis—Rottlera tinctoria*).—The new body crystallizes in flesh-colored needles, is easily soluble in alkalies, forming yellowish-red solutions, and reprecipitated from such unchanged by acids. It has a composition corresponding to the formula $C_{11}H_{10}O_3$ or $C_{18}H_{16}O_5$. It is suggested by a reviewer of the paper of the Messrs. Perkin that their mallotoxin is probably identical with the *rottlerin* of Anderson, who obtained the latter in nearly colorless crystals, to which he assigns the formula $C_{11}H_{10}O_3$.—Arch. d. Pharm., April 1887, 354; from Ber. d. D. Chem. Ges., 1886, 3109.

Wars (Wurrus)—*Distinction from Kamala, etc.*—In 1884, Mr. Kirkby figured a new variety of wurrus (or wars) and described it carefully (see Proceedings 1884, 197–199). Prof. Edward Schaer, having received a supply of wars from Aden recently, submitted it to Prof. Flückiger, who finds it to be identical with the wars described by Mr. Kirkby. He concludes that we may now distinguish three different drugs, viz.:

I. *Kamala*, the well-known glands of *mallotus* philippinensis. This is the *true* kamala.

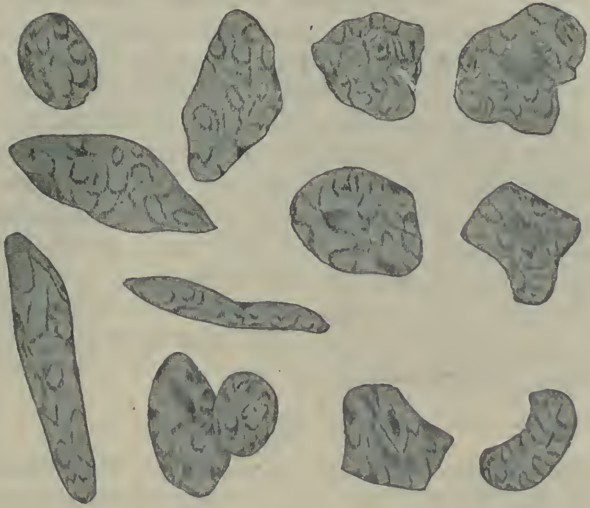
II. *Wars*, the glands of *Flamingia rhodocarpa*, Baker, a species not specifically distinguishable from *F. Grahamiana*, W. and A. growing in Southern India. This is the *new* kamala or *true* wars.

III. *Kirkby's Wars*, the glands of a plant which has as yet not been determined. The specimen presented by Prof. Schaer to the author had been imported into Aden from Harrar.

Kirkby's wars may be separated into three different constituents. (1) Inorganic matter intermixed with a few simple hairs, which Prof. Flückiger designates as *dust*. (2) The *glands* characteristic of this kind of wars. (See Fig. 21). (3) A large amount of heavy brown matter, which, in all probabilty, has nothing to do with wars, and which consists of something like ferruginous sand. It probably amounts to 45 per cent. of the drug, and was found to consist mainly of ferric oxide.

The true character of this wars is shown by the above mentioned second portion of the drug, which Mr. Kirkby terms correctly "glands." The appearance of these glands is, however, not exactly granular, as shown in Kirkby's figure, but rather cloudy, or somewhat, as it were, stratified, or shriveled. The glands, on an average, are not larger than those of true wars ("new kamala"), but of a totally different outline. They are either nearly globular, or ovoid, or slightly tapering, many of them resembling, as to their shape, the starch grains of potatoes; sometimes also

FIG. 21.



Waras, Glands as seen under Glycerin.

they are tapering, or nearly kidney-shaped or crescent-shaped forms, or glands approaching to a cylinder. In fact, as Mr. Kirkby has already stated, there is scarcely any prevailing form. The accompanying sketches (see Fig. 21) may, at least, afford an idea of the great variety exhibited by these curious glands. If they are moistened with an aqueous solution of iodine, their very faintly reddish hue is at first but very little affected. By and by it turns more distinctly red, or somewhat violet, and after a few minutes blue spots make their appearance in the glands, resembling, to some extent, granular matter enclosed within some membrane. The author's experiments prove, however, that this bluing effect is not due to starch, but to some as yet undetermined substance.—Pharm. Jour. and Trans., June 18, 1887, 1029–1031.

Mercurialis Annua—Toxic Character of the Seeds.—Mr. C. Bernbeck draws attention to the evident toxic character of the seeds of *Mercurialis annua.* A number of chickens that had died from some unexplained cause were examined, and the seeds of this plant found in the stomach of each.—Arch. d. Pharm., Sept. 1886, 799.

Croton Alabamense—Restricted Distribution.—Prof. Charles Mohr gives a description and illustration of this plant, which was found by Dr. E. A. Smith on the limestone hills in the valley of the Catawba river, Bitt county, Alabama, and submitted to Professor Mohr for identification. Notwithstanding diligent search, this plant has not been found in any other locality. It is a shrub, 6 to 10 feet high, numerously branched from the ground up. The trunk, which is 1 to 1½ inch thick, is covered with gray or dirty-white bark. The shortly petioled leaves are 2½ to 3 inches long by ½ inch wide, blunt at the end nearest the petiole, free from glands, deep green on the upper surface, and covered with a felty mass of minute, silver-white, metallic glistening scales, as are also the peduncles and the young branchlets. The flowers, which are in form of a short monodelphous raceme, are developed in early spring. The male flowers, which begin to bud already late in fall, form racemes, about ¾ inch in length, on the end of the branches. The petals, which in both male and female flowers have hirsute edges, are somewhat shorter than the five-pointed calyx, and enclose 20 or more stamens. The female flowers are pedunculed, and are found either single or loosely united raceme. The calyx encloses undivided pistils. The felty capsules are considerably larger than the calyx, and enclose egg-shaped, smooth, dark-spotted seeds.—Pharm. Rundschau, 1887, 9–10.

AQUIFOLIACEÆ.

Ilex Opaca, Aiton—*Proximate Examination.*—Mr. Walter A. Smith treated the leaves of *Ilex Opaca*, Aiton, with benzin, and obtained 1.2 per cent. extract, of which .088 was volatile, and had an acrid mustard-like odor; the remainder consisted of fat and .152 wax. Ether extracted 4.5 per cent., .5 of which was soluble in water, the remainder being resin soluble in alcohol; the aqueous solution had a bitter taste, and from its behavior to Fehling's liquid appears to contain a glucoside. Tannin and chlorophyll were found in the alcoholic tincture. The leaves yielded 4.5 per cent. of ash.—Amer. Jour. Pharm., May 1887, 230.

URTICACEÆ.

Cannabis Indica—Physiological Action of Different Preparations.—Dr. J. Roux has experimented with different preparations of cannabis indica made by Duquesnel. The drug was exhausted with alcohol, and the alcoholic extract was freed from matters soluble in water which were inert; the remaining green mass was then treated with petroleum benzin and with ether. Of the three extracts thus obtained, that made with ether produced insignificant results. The petroleum extract was found to be excitant and convulsivant, and in the dose of a gram produced coma and in 11 or 12 hours death of the animal. The alcoholic extract has narcotic properties, but its action is uncertain, if small doses are given.—Archives de Pharm., 1887, 1.

Indian Hemp—Identification of the Alkaloid with Choline.—Mr. E. Jahns observes that the experiments hitherto recorded respecting the presence of an alkaloid leave no doubt as to the existence of a basic substance in Indian hemp. He now records some experiments which prove very conclusively that the Indian hemp does contain a basic substance, but that this base is not an active alkaloid, peculiar to the plant, but simply *choline.* No other alkaloidal constituent could be detected.—Arch. d. Pharm., June 1887, 479–483.

UNCLASSIFIED.

Catha Edulis—Proximate Examination.—Dr. B. H. Paul, in view of the reputation that the leaves of *Catha edulis* have on account of their stimulating effect, and the use to which they are applied by the Arabs, undertook their examination, the probability being suggested that they might contain caffeine or some similar substance. He, however, failed to separate caffeine or any other alkaloid from them. So far as he is able to judge from the results of his examination, he is disposed to think that the stimulating effects attributed to the leaves when chewed may be due to ethereal oil or some other aromatic or volatile constituent. The limited quantity of drug at his disposal prevented a determination of this point. He determined the presence of a form of tannic acid closely analogous to that met with in tea, coffee, maté and coca leaves.—Pharm. Jour. and Trans., June 11, 1887, 1009.

Microrhynchus Spinosus, Benth. — *Characters, etc., as Observed in Afghanistan.*—Mr. J. E. T. Aitchison draws attention to this plant, which yields a milky juice upon injury, drying in small, greyish-black pieces, irregular in form, the largest the size of a pea. This is collected in Afghanistan, and sold under the name of "false *Anzérút*" (the name given to the true pine resin), and the author describes it as having the most nauseous and offensive odor of any substance he has ever come across. The plant yielding it, called *chir-kah,* is a small shrub from 1 to 2 feet in height, with numerous intricately-twisted branches, interlaced so as to give the shrub the form of a ball, and is apparently leafless.—Pharm. Jour. and Trans., Dec. 11, 1887, 468.

B. ANIMAL DRUGS.

PORIFERA.

Bahama Sponges—Description of Varieties.—Mr. E. M. Holmes has had opportunity to study the character of typical specimens of Bahama sponges, exhibited in the Colonial and Indian Exhibition, and communicates an interesting description of them, which are referred by Mr. Hyatt to the following sub-species:

Reef, or glove sponge, to *Spongia officinalis,* var. *tubulifera.*

Sheep's wool sponge, to *Spongia equina,* var. *gossypina.*

Abaco velvet and cay velvet sponge, to *Spongia equina,* var. *meandriniformis.*

Grass sponge, to *Spongia equina,* var. *cerebriformis,* and *Spongia graminea.*

Hardhead sponge, to *Spongia agaricina,* var. *typica.*

Yellow sponge, to *Spongia agaricina*, vars. *corlosia*, *dura* and *punctata*. Mr. Holmes' paper is reprinted from Pharm. Jour. and Trans. (March 19, 1887, 761), in Amer. Jour. Pharm., May 1887, 258–262.

INSECTS.

Insects that Destroy Drugs.—Mr. Hugo Lojander communicates an interesting paper respecting the insects that destroy drugs, to which reference may be had in Arch. d. Pharm., Sept. 1886, 796–798.

Australian Black Bees—Characters of the Insects and their Honey.—Dr. Thomas Caraman has recently called attention to the small black wild bees and their honey, which a distinguished French naturalist, Mr. Guilmeth, has obtained in a grove of gigantic eucalyptus trees in Tasmania. The amount of honey produced is prodigious, the largest individual store weighing as much as 11,000 pounds avoir. The honey is described as thick, homogeneous, somewhat transparent, syrupy, of a deep orange color; odor suggestive of its containing eucalyptus principle; sp. gr. 1.44. It is composed of 61.1 of invert sugar, 21.5 of water, 0.2 of ash, and 17.1 of active principle, embracing eucalyptol, eucalyptene, terpene, cymol, and odorous resinous and coloring matter. The author attributes marked remedial properties to this honey, and believes it destined to play a great part in the treatment of laryngeal, bronchial, pulmonary, cardiac, and scrofulous affections, etc., etc.—Pharm. Jour. and Trans., June 18, 1887, 1016.

Honey—Characters, etc.—Mr. Chas. S. Commings states that honey gathered from white clover, basswood and raspberry is of a light color and has a delicious flavor; but the bees will not gather it from white clover as long as it can be gotten from other plants. Considerable honey is also found in the blossoms of fruit trees, of the maple, locust and other plants. Buckwheat honey is considered inferior, it being darker in color and less agreeable in flavor than that procured from many other plants.

Honey may be kept from crystallizing or candying by suspending the vessel containing it in water, applying heat, and stirring the honey constantly, until the water is heated to the boiling point, when the vessel is taken from the fire, the scum removed, and, after cooling, the honey is placed in jars or other suitable vessels, tightly covered and kept in a cool cellar. Treated in this manner, Mr. Commings has kept honey from twelve to sixteen months without crystallizing.—Amer. Jour. Pharm., Nov. 1886, 539.

Beeswax—Constituents.—Mr. F. Schwalb communicates the results of some experiments upon beeswax made with particular reference to its non-acid constituents. Repeated boiling with alcohol extracts about 5 per cent. of cerotic acid from beeswax. The residue is saponified with alcoholic soda, and after the alcohol has been removed by distillation and by boiling with water, the soap is separated by the addition of common salt. To remove any free alkali, the soap is pressed in a cloth, redissolved in hot water, and again salted out. This operation is repeated several times. The soap is thoroughly dried at 110—120°, and the non-acid constituents are separated by fractional solution in, and re-crystallization from, light petroleum. The most soluble portion of the extract, melting between 55^c and 65°, contains two hydrocarbons; one melting at 60.5° appears to be identical with Krafft's normal heptacosane, $C_{27}H_{56}$ (1882), and the other, which melts at 67°, is probably identical with normal hentriacontane, $C_{31}H_{64}$. It is probable that other hydrocarbons are also contained in the wax. The myricyl alcohol is less soluble in light petroleum than the hydrocarbons. It appears to have the formula $C_{31}H_{64}O$, and is not identical with the alcohol $C_{30}H_{62}O$, contained in carnauba wax. It melts at 85–85.5°, and resolidifies at 84°. When heated with soda lime, it is converted into the salt of an acid, $C_{31}H_{62}O_2$. This acid is sparingly soluble in the usual solvents at the ordinary temperature, but it dissolves in hot light petroleum, and is deposited from the solution in white needle shaped crystals, which melt at 88.5–89°. The lead salt melts at 115—116°, and dissolves freely in acetic acid and in boiling toluene. The silver salt is amorphous. It melts at 180°, with decomposition. The copper and magnesium salts are also amorphous. They dissolve in boiling benzene. The methyl and ethyl salts crystallize in needles. They dissolve freely in warm ether and warm alcohol. The methyl salt melts at 71–71.5°, and the ethyl salt at 69.5–70°. Heated under the ordinary atmospheric pressure, the ethyl salt decomposes before boiling into ethylene and the free acid. Beeswax also contains two lower alcohols, namely, ceryl alcohol, $C_{26}H_{54}O$ or $C_{27}H_{56}O$, and an alcohol of the formula, $C_{24}H_{60}O$ or $C_{25}H_{52}O$.—Jour. Chem. Soc., Feb. 1887, 124; Liebig's Annalen, ccxxxv, 106.

Yellow Wax.—Method of powdering for the purpose of pill excipient. See *Pill Masses* under "Pharmacy."

Beeswax—Specific Gravity.—Mr. E. Dieterich observes that the determination of the specific gravity is an important factor in the determination of the purity of beeswax. He recommends for this purpose the following modification of Hager's method: A large piece of wax is heated on the edge of an alcohol-flame so that drops of melted wax may fall into alcohol placed in a flat vessel, and as close as practicable to the melting wax. Having thus obtained about a dozen wax-pearls or granules from the sample under examination, these are placed upon blotting paper and allowed to remain for 18–24 hours. Having prepared eight portions of diluted alcohol, having respectively the s. g. of 0.960, 0.961, 0.962. 0.963, 0.964, 0.965, 0.906 and 0.967, one of the wax-pearls is placed into each of these liquids, the s. g. of the wax being that of the liquid in which it floats in the intermediate stratum, neither sinking towards the bottom nor floating on the surface. The author has found the

s. g. of pure beeswax, in the course of hundreds of examinations made annually, to range from 0.963–0.966.—Arch. d. Pharm., Feb. 1887, 132; from Pharm. Ztg., 1887, 32, 37.

Huechys Sanguinea—A New Variety of Chinese Cantharides.—Mr. John Moss draws attention to a fly which appeared early in 1887 in the London drug market under the name of "Chinese Cantharides." The author describes this fly as a coleopterous insect, from twelve- to fifteen-sixteenths of an inch long, with a vermilion red abdomen and dull blackish brown thorax and wing cases. It has also very large and prominent eyes, two large vermilion cordate spots symmetrically placed behind the head, and a keel-like protuberance of the same color between the eyes, but rather below them. It has the smell of cantharides, but experiments made in different directions to ascertain its vesicant value have given negative or unsatisfactory results, the most efficient preparation obtained simply producing mild rubefacience. A crystalline body, resembling cantharides, could not be obtained. The new fly is evidently *Huechys sanguinea*, described as the "Red Lady Bug" in Dr. Porter Smith's "Chinese Materia Medica." Presuming that the insects experimented upon were mature, Mr. Moss believes that the new drug will not be a useful addition to materia medica.—Pharm. Jour. and Trans., April 16, 1887, 845.

Cantharides—Value as a Preventive of Hydrophobia.—Dr. Karchewski has treated three persons, who had been bitten by a rabid wolf, with cantharides plaster applied to the wounds, giving at the same time one grain of powdered cantharides daily for one week. After seven months no symptoms of rabies have appeared. This method of treatment was recommended as being always successful by Dr. J. N. Rust, of Berlin, in the early part of this century. For external use he ordered:

Cantharid	gr. xij.
Lapid. cancror,	
Sacchari	aa ʒjss.
M. ft. pulv. xij.	

One powder to be taken twice or thrice daily.

In this connection it may be mentioned that according to "Les Nouveaux Remèdes," 1886, p. 525, Dr. Keegan has treated in India, with apparent success, several cases of hydrophobia by the local application of a four per cent. solution of *cocaine* to the back part of the throat; and that Dr. Fernandez, of Barcelona (Ibid., p. 521), is experimenting upon dogs by inoculating them with *viper poison* as a preventive of rabies.—Amer. Jour. Pharm., March 1887, 151–152; from Brit. Med. Journ.

Cantharides—Fraudulent Extraction.—Messrs. J. O. Braithwaite and E. H. Farr draw attention to cantharides which had evidently been extracted for fraudulent purposes. The physical differences were not very evident, but the peculiar odor was wanting, and they yielded only about one-fifth as much extract to ether as did a normal sample.—Pharm. Jour. and Trans., Nov. 13, 1886, 399.

MAMMALIA.

American Musk—Examination and Value as a Perfume.—Mr. Charles Symes has examined some "American" musk, derived from the musk-rat (*Fiber zibethicus*), which heretofore has been suggested by several authors as a substitute for true musk for certain purposes. Mr. Symes finds the sacs to be saturated with a rancid oil, which makes itself evident to the sense of smell in the extracts made from the drug, unless this is first removed. On the whole, he considers this kind of musk to be somewhat unsatisfactory, but suggests the preparation of an *essence* as follows: Take 4 ounces of the pods, cut small and press gently between several folds of bibulous paper, wash lightly with about 2 ounces of methylated ether, pour off, and allow the remaining ether to evaporate by a short exposure to the air; put into a wide-mouthed bottle with 15 ounces rectified spirit, 5 ounces distilled water, 20 minims liquid ammonia, and ¼ ounce powdered animal charcoal; allow all to stand, with occasional agitation, for a month, and filter through magnesia. The finished essence, which is suitable for soaps, retains little of the rancid odor, most of the oil having been removed by the treatment with bibulous paper and ether.—Yearbook of Pharm., 1886, 552–554.

INORGANIC CHEMISTRY.

GENERAL SUBJECTS.

Saline Compounds—Solubilities in Water.—Mr. James Kennedy discusses the subject of solubilities in an interesting manner, and has determined the following solubilities of different salts at 59° F.:

	Parts of distilled water.
Potassium chlorate ($KClO_3$)	16.5
Borax ($Na_2B_4O_7, 10H_2O$)	16.0
Sodium acid carbonate ($NaHCO_3$)	14.0
Potash alum ($K_2Al_2(SO_4)_4 24H_2O$)	10.5
Potassium sulphate (K_2SO_4)	9.0
Potassium nitrate (KNO_3)	4.0
Ammonium carbontae ($NH_4HCO_3NH_4NH_2CO_2$)	4.0
Sodium chloride ($NaCl$)	2.8
Cuprous sulphate ($CuSO_4$)	2.6
Sodium sulphate ($NaSO_4$)	2.8
Ferrous sulphate ($FeSO_4$)	1.8

Sodium bromide ($NaBr$)	1.8
Potassium bromide (KBr)	1.6
Potassium iodide (KI)	0.8
Magnesium sulphate ($MgSO_4$)	0.8
Potassium acetate ($KC_2H_3O_2$)	0.4
Zinc sulphate ($ZnSO_4, 7H_2O$)	0.6
Sodium iodide (NaI)	0.6

—Nat. Drugg., Oct. 15, 1886, 190.

Free Acid—Determination by Congo-red, which see under "Organic Chemistry."

OXYGEN.

Oxygen—Estimation in Water.—Miss K. I. Williams and Professor W. Ramsay have instituted a comparison of Schützenberger's methods of estimating *free* oxygen in water with each other and with the gasometric method. Schützenberger's first method, which consists in adding hyposulphite of sodium to a measured quantity of water, using indigo-carmine as an indicator, is stated by him to estimate only half the amount of free oxygen; his second method, in which water containing free oxygen is added to indigo-white, turning it blue, and the amount of oxidized indigo-white is estimated by hyposulphite, was regarded by him as the only accurate one. The authors disprove these assertions, and show that there is a preliminary stage in the first process when color disappears; but that on standing for some time a blue color appears, to destroy which permanently requires such an addition of hyposulphite as to make the total amount equal to that employed in operating according to second method. The proportion of hyposulphite used during the first stage of the first method to the total amount used is 3 to 5, but the authors believe that this proportion was conditioned by the temperature and dilution prevailing during the experiments. It is also shown that hyposulphite of sodium reacts to some extent with hydrogen dioxide, thus negativing the statements of Schützenberger.—Pharm. Jour. and Trans., July 3, 1886, 18.

Ozone—Liquefaction and Boiling Point.—Mr. K. Olszewski has determined the boiling point of liquid ozone to be approximately at —106°. The ozone was liquefied by the aid of *aethylene*—the congealing point of which the author has incidentally determined to be at —181.4°, forming white crystals which melt again at —169.°. The experiments with liquid ozone must be made with great care, since it explodes violently in contact with aethylene. A small drop of liquid ozone, when sealed in a tube, will change at the ordinary temperature into a bluish gas, which again condenses to a dark-blue liquid when the tube is dipped into liquid aethylene.—Arch. d. Pharm., May 1887, 454; from Monatsh. f. Chem., 8, 69.

Active Oxygen (Ozone)—Sensitive Reaction.—Mr. C. Wurster, who has found all of the reagents at present in use for the detection of active oxygen, either as ozone or peroxide of hydrogen, to be insufficiently sensitive, finds that

Dimethyl- and Tetramethyl-paraphenylendiamine to be extremely sensitive to its action, being converted into coloring matters, while at the same time these agents are exceedingly resistant to all other influences. A reagent paper prepared witht etramethyl-paraphenylendiamine enables the detection of the smallest traces of active ozone, either in its free state or in its combinations. The presence of active oxygen in the air, near flames, in plant juices, and even upon the human skin, is easily detected. The paper is colored by aldehydes, by volatile oils, by acetone, etc., etc. —Arch. d. Pharm., Mar. 1887, 258; from Ber. d. D. Chem. Ges., 19, 3195.

HYDROGEN.

Water—Presence of a Reducing Agent.—According to the observation of Professor Ramsay, distilled water, as also ordinary tap water, has a reducing action on permanganate of potassium. The amount of reducing agent is increased by evaporation, even when all possibility of contamination with solid organic impurity is excluded. The amount of reduction is far too great to be ascribed to the nitrites present in the water, and the author's experiments, which he records in a paper read before the Chemical Society of Great Britain, point to hydrogen dioxide. If this supposition be correct, and the active substance in natural water be really hydrogen dioxide, it becomes of importance to ascertain its action on organic impurities contained in many natural waters. Experiments were therefore made quantitatively on the action of dilute solutions of hydrogen dioxide on urea, and it was found that the urea is slowly oxidized on standing; the rate of this action has also been measured.—Pharm. Jour. and Trans., July 3, 1886, 19.

Water.—Estimation of free *Oxygen*, which see.

Water.—Determination of Organic Substances, see *Formic Acid* under "Organic Chemistry."

Water—Determination of Nitrites, which see under "Nitrogen."

Well-water—Incompatibility with Corrosive Sublimate, which see under "Hydrargyrum."

Water—Purification by Alum.—Prof. Peter T. Austen discusses the use of alum as a purifying agent for water intended for manufacturing purposes, and more particularly in dyeing. He infers from his experiments that the addition of 2 grains of alum to a gallon of water will clarify it by standing. Some waters may require less, and some may require a longer standing than 48 hours. The water, after precipitation has taken place, is perfectly clear and sparkling, and has neither taste nor smell imparted to it. The most practical way of applying the method is to fill two or more vats of suitable capacity with the water, to add for each 100 gallons of water one-half ounce of alum, best dissolved in hot water, and stirring thoroughly with a stick to insure uniform admixture. The water is then allowed to stand undisturbed for 48 hours, or until it clarifies. To withdraw the water a pipe should enter the side of the tank near the bottom, to pass to the middle, and then be bent upwards to the height of about one foot. This arrangement causes the water to be drawn from above, and prevents the disturbance of the precipitate. Each vat is provided with an outlet at the bottom for the withdrawal of the precipitate after the water has been consumed, a strong current of water being employed for its rapid and complete removal.—Chem. News, July 23, 1886; from the "Textile Colorist."

Peroxide of Hydrogen—Determination.—Mr. Blarez has experimented with a view to ascertaining a simple method of determining peroxide of hydrogen. He finds that no special apparatus is necessary when peroxide of lead or peroxide of manganese are employed, the simply constructed apparatus used for urea determination by means of hypobromite of sodium answering perfectly: the hypobromite being replaced by one of the metallic peroxides, whilst the urea solution is replaced by the peroxide of hydrogen to be examined. The reactions are as follows:

$$MnO_2 + H_2O_2 = MnO + H_2O + O_2 \text{ or } PbO_2 + H_2O_2 = PbO + H_2O + O_2.$$

It will be noticed that only one-half of the oxygen liberated is supplied by the peroxide of hydrogen, the other half being furnished by the metallic peroxide. This has been long known to be the case in the instance of the peroxide of lead, but not in the instance of the manganese compound. Commercial peroxide of hydrogen never being free from acid, the metallic peroxide yields a portion of oxygen, hence the necessity that only one-half of the oxygen developed should be credited to the peroxide of hydrogen. It is, furthermore, advisable to make the permanganate test for the purpose of control.—Arch. d. Pharm., 1886, 552; from Jour. Phar. Chim., 1886, 185.

Mr. Riche has experimented in the same direction, and has arrived at the same conclusion. He lays particular stress on the invariable presence of acid in variable proportions in the commercial peroxide of hydrogen, and recommends therefore that an excess of sulphuric acid should always be added before adding the peroxide of manganese. The determination is best made by strongly acidifying 4–6 cc. of the peroxide of hydrogen with dilute sulphuric acid, and then adding 0.5 grams peroxide of manganese. In this way one-half of the oxygen in each of the substances is eliminated.—Ibid. (553), from Ibid. (249).

Peroxide of Hydrogen—Method of Titration.—Mr. H. Thomas has subjected the different methods for the determination of peroxide of hydrogen, and recommends as preferable to all others, the estimation of active oxygen in commercial peroxide of hydrogen solutions, by mixing it with acid solution of iodide of potassium in excess, and titrating the amount of iodine liberated by $\frac{1}{10}$ normal solution of hyposulphite of sodium. 1 cc. of this solution decolorizes the iodine liberated by 0.0017 H_2O_2.—Arch. d. Pharm., April 1887, 335–343.

Peroxide of Hydrogen—Estimation with Permanganate of Potassium.—Mr. H. W. Snow communicates his experiments made to determine the reliability of the method of determining peroxide of hydrogen by means of permanganate of potassium in the presence of dilute sulphuric acid. He recommends the following: Make a $\frac{1}{5}$ N. solution of permanganate of potassium by dissolving 6.32 grams of the salt in one liter of water, and with this solution titrate 5 cc. of the sample to be tested, and which has been slightly acidified with sulphuric acid, to a slight color. The number of cubic centimetres of permanganate used, divided by the number of cubic centimetres of peroxide of hydrogen taken, and the product multiplied by 2.2328, gives the number of volumes of oxygen which the preparation will yield. Employing this method in the testing of ten samples, the author obtained the following results: 14.8, 19.4, 11.9, 0.8, 10.8, 7.3, 20.9, 17.1, 19.2, and 16.2 volumes in the respective samples.—West. Drugg., July 1886, 255–256.

NITROGEN.

Nitrogen—Modification of Kjeldahl's Method of Determination.—Mr. C. Arnold communicates some experiments made with a view to improving Kjeldahl's method for the determination of nitrogen and extending its applicability. He gives the details of his modification, accompanied by a cut of the improved apparatus necessary, and finds that under proper conditions the method is applicable to the determination of nitrogen not alone in the compounds hitherto recommended to be determined by the method, but also for nitrate, nitro- and cyanogen compounds, and alkaloids.—See Arch. d. Pharm.. Sept. 1886, 785–793.

Nitrous Acid—Value of its Vapors in Treating Mucous Membranes of the Respiratory Passages.—A communication has been sent to the Academy of Sciences claiming great success in treating the mucous membranes of the respiratory passages, by a means which most chemists will regard as queer. The remedy consists in pouring fuming nitric acid on a copper plate and inhaling the fumes.—Amer. Jour. Pharm., June 1887, 295.

Nitrites—Therapeutic Value of Different Kinds.—Mr. G. Armstrong Atkinson communicates a lengthy paper in which he discusses the relative value as therapeutic agents of the different nitrites. He considers the acid, the ammonium and sodium salts, and the amyl, methyl, ethyl and glycerin compounds, and expresses the opinion that only three of these are worthy of a permanent place in therapeutics: *nitrite of amyl*, for inhalation; *nitrite of sodium* and *nitro-glycerin* for internal administration. For subcutaneous injection any of the three may be used, but the author prefers nitrite of sodium. The decomposition of nitrite of sodium by the gastric juice can be largely or entirely obviated by prescribing it with carbonate or bicarbonate of sodium.—Pharm. Jour. and Trans., July 1886, 1–4.

Nitrites—Estimation in Water.—Mr. Zambelli recommends that to 200 cc. of the water several drops of solution of sulphanilic acid, acidulated with sulphuric acid, be added, the glass cylinder containing the mixture being closed for 10 minutes. The liquid is then made alkaline with ammonia, and a few drops of aqueous solution of phenol are immediately added. In the presence of nitrites a yellow color is produced, which is evident by looking through the entire column of the liquid, in the direction of the length of the cylinder, if the water contains 1 part of nitrite in 4 million parts.—Arch. de Pharm., Jan. 1887, 89; from Ann. di Chim. di Farmacol., Oct. 1886, 231.

Nitric Acid—Determination as Ammonia.—Prof. E. Reichardt makes some observations respecting the determination of nitric acid in potable waters. For qualitative work he finds the brucine test to be so delicate as to answer all requirements. For quantitative work he prefers the determination of nitric acid as nitric oxide, when a number of such determinations are to be made; but when single determinations are to made, its determination as ammonia is more convenient. A possible source of error in connection with the ammonia process is the occurrence of nitric acid in the caustic soda or potassa employed. To avoid this the author recommends that the alkali be melted in a silver crucible, some powdered zinc added, stirred, and tested from time to time until a small portion, dissolved in a drop of water, no longer gives the brucine reaction. The process is rapidly ended and the alkali may be mixed at once with zinc and iron, and employed for the determination of nitric acid.—Arch. d. Phar., Sept. 1886, 798–799.

Nitrates—Estimation in Potable Waters.—Prof. Albert B. Prescott contributes a paper on the estimation of nitrates in potable waters, and recommends the method of Williams as modified by Blunt ("Analyst," 1881, 36 and 202). The operation is one of reduction of nitrogen from both nitrates and nitrites, to ammonia, by the "zinc-copper couple," and as applied by the author is given in detail. The author also presents results of a few control-analyses recently made by him, and gives some references for the convenience of persons who may desire to study what has been published on this and other related methods, the above method being commended to the attention of any analysts of water not already familiar with its use.—Pharm. Era, April 1887, 99–100.

SULPHUR.

Sulphur—Volumetric Determination in Metallic Sulphides.—Mr. Weil determines the sulphur in metallic sulphides volumetrically as follows: A weighed quantity of the powdered sulphide is placed into a flask, arranged for generating gases, with an excess of hydrochloric acid and some zinc. Heat is applied, and the sulphuretted hydrogen liberated is collected into a clear solution of a weighed quantity of sulphate of copper in ammonia, observing that the copper salt be in excess of the expected amount of sulphur. When gas ceases to be generated, the ammoniacal mixture is brought to a specific volume, and the sulphide of copper is allowed to deposit perfectly. When perfectly clear, from 10 to 20 cc. of the blue liquid are treated with a large excess of hydrochloric acid, and then titrated with solution of stannous chloride, of known titre, until the solution becomes colorless. The amount of sulphate of copper so ascertained is deducted from the total amount originally employed, and the difference affords the data for calculating the quantity of sulphur present in the sample under examination.—Arch. d. Pharm., Nov. 1886, 943; from Jour. de Pharm. et de Chim., 1886, xiv, 198.

Sulphur—Occurrence and Refining in Utah.—Mr. Harry C. Myers draws attention to the immense sulphur deposit in Utah, which was located in about 1870, by the Government Surveyor, and is situated two hundred miles south of Salt Lake City, between the counties of Millard and Beaver, on Cove Creek.

The deposit is about two thousand feet square, and shafts have been sunk in different places from thirty to sixty feet deep without reaching the bottom of the deposit; the depth is as yet unknown. It is easy to see by using these figures and multiplying by the weight of a cubic foot of sulphur, which is over a hundred pounds, that this deposit contains easily ten million tons of sulphur. The poorest ore yet found in this locality contains 40 per cent. sulphur, and is almost black in color; but as the 90 per cent. ore is inexhaustible, the poorer ores are disregarded. These ores were analyzed at Case School of Applied Science, by a familiar process, and found to be absolutely free from arsenic and antimony, which cannot be said of our imported Sicily sulphur. The sulphur in this deposit is in strata, measuring from eleven to twenty-two inches in thickness, and as it is a surface deposit, it is worked much like the quarrying of stone. It is then refined by a new process, which consists of melting the sulphur, forcing and straining it through a cylinder by the heat and pressure of steam, and as the ore is only contaminated with lava sand, it is very easily separated.

Rich deposits of sulphur were also discovered in New Mexico, as well as in California and Colorado; in fact, at the Exposition at New Orleans nearly all the western States reported sulphur deposits and exhibited specimens of the ore, but owing to lack of railroad facility, or extent of the ore, these deposits have not been operated to any degree.—Amer. Jour. Pharm., Jan. 1887, 16–18.

Precipitated Sulphur—Contamination with Iron.—Mr. A. Berwick draws attention to the observation of iron in a sample of precipitated sulphur, as evidenced by ferrocyanide of potassium in the solution obtained by treating the sulphur with hydrochloric acid. This contamination is not noticed in the Pharmacopœia (Germ.), but all the more likely to be present from the fact of its being prepared, by manufacturers, in iron vessels.—Arch. d. Pharm., April 1887, 310.

Monosulphide of Sodium—Preparation of Crystals with Variable Proportions of Water of Crystallization.—Monosulphide of sodium has hitherto been prepared for analytical purposes by mixing equal quantities of a moderately concentrated solution of soda with a solution of soda of the same strength completely saturated with sulphuretted hydrogen, then concentrating in a vacuum. The resulting compound has the composition $Na_2S.+9H_2O$. Mr. Ch. Göttig has now shown that when an alcoholic solution of soda is partially saturated with H_2S under certain conditions, a copious formation of crystals results, the composition of which, under different conditions, may correspond to one of the following four formulas:—Na_2S+5H_2O; $2Na_2S+11H_2O$; Na_2S+6H_2O; Na^2S+9H_2O. If the introduction of H_2S is continued, the crystals disappear.—Jour. prakt. Chem., 34, 229.

Violet-phosphorescent Sulphide of Calcium—Composition and Preparation.—A very durable violet-phosphorescent sulphide of calcium, the preparation of which is kept secret, is now found in commerce. According to an analysis given in "Chemisch Technischer Centr. Anzeiger" (iv. 845) the new compound consists of 37 sulphide of calcium, 50 lime, 7 sulphate of calcium, 5 carbonate of calcium, and traces of silicic acid, magnesia, phosphoric acid, and alkalies. The following formula is recommended as yielding the best product; 20 grams of lime prepared from the shells of *Hypopus vulgaris* are finely powdered and intimately mixed with 6 grams of roll sulphur and 2 grams of starch. About 8 cc. of a solution of 0.5 gram subnitrate of bismuth in 100 cc. absolute alcohol and several drops of hydrochloric acid, are dropped on the mixture, the alcohol is allowed to evaporate spontaneously, and the mixture is heated in a crucible to bright cherry redness for 20 minutes. On cooling, the thin layer of sulphate of calcium is removed, and the contents of the crucible again heated for about half an hour. If the heat was not too intense the mass will be granular, breaking readily on slight pressure. It loses some of its phosphorescence on powdering.

Hyposulphite of Sodium.—Occurrence as a contaminant of *Bicarbonate of Sodium*, which see under "Sodium."

Hyposulphite of Sodium—Oxidation by Permanganate of Potassium.—Mr. M. Glaser has observed that when a solution of hyposulphite of sodium is treated with solution of permanganate of potassium, a portion of the hyposulphite, amounting to between 1 and 2 per cent., resists oxidation even during prolonged boiling. If, however, the solution of hyposulphite is added to excess of solution of permanganate, the oxidation into sulphate is complete after 15 minutes' boiling.—Arch. d. Pharm., March 1887, 260; from Monatsh. f. Chem. vii, 651.

Hyposulphite of Sodium—Substitution for Sulphuretted Hydrogen in the Course of Qualitative Analysis.—Hyposulphites have been repeatedly recommended as substitutes for sulphuretted hydrogen in qualitative analysis (see Proceedings 1884, 210–211). Mr. G. Vortmann has now worked out a systematic course of qualitative analysis, in which hyposulphite of sodium is used to the complete exclusion of sulphuretted hydrogen, for which reference must be had to the author's paper in Monatsh. f. Chem. vii, 418.

Sulphuric Anhydride—Compounds with Selenous and with Arsenious Acids, etc.—Mr. Rud. Weber describes compounds of sulphuric anhydrides with selenous and with arsenious acid. Selenous acid combines easily, and the compound SeO_2+SO_3 is readily distilled off at a gentle heat. It melts easily, forms in cooling handsome crystals, and is decomposed by water as well as when heated to 100°. By the combination of arsenious acid with sulphuric anhydride, two compounds are obtainable, viz.: $AsO_{23}+6SO_3$ at 60°, and $As_2O_3+3SO_3$ at 100°. The author has furthermore found that by careful distillation the anhydrous sulphuric acid may be obtained in form of a liquid, which does not congeal above 15°, and then melts again to form a colorless liquid. The smallest trace of moisture causes the separation of solid acid, and it appears from this observation that the ordinarily observed reactions of sulphuric anhydride are determined by the presence of small quantities of H_2SO_4.—Arch. d. Pharm., March 1887, 257; Ber. d. D. Chem. Ges., xix, 3185.

Sulphuric Anhydride—Compounds with Phosphoric and with Iodic Acids.—Mr. R. Weber also describes the compound $P_2O_5,3SO_3$ and $I_2O_5, 3SO_3$, which see in Ibid., 259, from Ibid., xx, 86.

Sulphuretted Hydrogen—Purification.—In connection with his comprehensive studies of titanium (which see) Mr. O. von der Pfordten mentions that pure sulphuretted hydrogen is obtained by removing the oxygen with chloride of chromium and then drying the gas by means of phosphoric anhydride.—Liebig's Annalen, ccxxxiv, 257.

Sulphuretted Hydrogen—Treatment of Phthisis Pulmonalis with a Mixture of this Gas and Carbolic Acid.—Dr. Bergeon proposes the treatment of consumptives with carbonic acid containing sulphydric acid, introduced *per rectum.* The carbonic acid, generated in a suitable apparatus, is passed through a solution of sulphide of sodium, thereby taking up a certain proportion of H_2S. The mixture of gases is introduced from a gum bag by pressure by means of an ordinary injection tube. The views expressed by medical authorities as to the value of the treatment are diametrically opposed to each other, some regarding it as an illusion of the most dangerous nature. The method, as far as communicated, bears the impress of empiricism, as regarded from the chemical standpoint, the relative proportion of sulphydric and carbonic acid being utterly disregarded.—Pharm. Rundschau, May, 1887, 116.

Dr. J. Solis Cohen reviews the results that have been obtained by Dr. Bergeon and others in the above treatment, and on the whole regards it favorably, though he advises that experiments be continued in hospitals, etc., to determine its permanent value. The following, respecting the preparation of artificial sulphur water for this purpose, is appended to the author's paper:

℞. Sodium sulphide, pure,	
Sodium chloride, āā	gr.v.
Water	f.℥xxij.

This is the formula first used at the Philadelphia Hospital. The hydrogen sulphide is formed by the action of the carbonic acid on the sodium sulphide substantially according to the following reaction:

$$Na_2S + H_2CO_3 = Na_2CO_3 + H_2S.$$

When pure sodium sulphide is not attainable, the potassium sulphuretum or corresponding sodium compound may be used. These must be used in rather larger proportion, and produce an objectionable white precipitate of sulphur.

When a stronger sulphur water is desired than that produced by the above formula, the following may be used:

℞. Sodium sulphide, pure	gr.x.
Dilute hydrochloric acid, U. S. P.	♏.xxx.
Water	f.℥xxij.

Mr. Kyner, who has proposed this formula, prefers to keep the liquid on hand after use, and freshen it up for subsequent use by additional quantities of sodium sulphide and dilute hydrochloric acid. This freshening up should be done whenever the liquid ceases to smell of the hydrogen sulphide. A liquid so kept seems to acquire more nearly the characteristic odor of the natural water. If the sulphur water is of sufficient strength, the patient's breath will, in about five minutes after beginning the administration, darken lead acetate paper, and will continue to smell of gas for an hour after the process is discontinued.—Drugg. Circular, May 1887, 104–105; from Weekly Medical Review.

SELENIUM.

Selenous Acid—Acidimetric Determination.—Mr. Blarez finds it expedient to make the acidimetric determination by the aid of baryta water, using phenolphthalein as indicated. An excess of baryta water is added, and the excess determined by titration with acid. When normal alkalies are employed the end-reaction is not distinct. Neither cochineal nor litmus will answer as indicators. The author's experiments lead him to the view that selenous acid, SeO_3H_2, is a bibasic acid.—Arch. d. Pharm., Jan. 1887, 37; from Jour. de Pharm. et de Chim., 1886, xiv, 524.

Selenous Acid.—Compound with *Anhydrous Sulphuric Acid*, which see under "Sulphur."

CHLORINE.

Chlorine—Method of Generation from Chlorinated Lime.—Mr. Cl. Winkler recommends the following method for the convenient preparation of chlorine. Dry chlorinated lime is mixed with one-fourth of its weight of freshly-burnt gypsum, mixed with cold water to form a paste, which must become somewhat brittle on being worked between the fingers. By means of an iron pestle, the mass is now made homogeneous, and it is pounded into a flat square mould, 10 to 12 mm. in depth, a sheet of gummed cloth is placed over it, and the mass is subjected to strong pressure. The cake thus obtained is cut into small cubes, rapidly dried at a temperature not exceeding 20°, and preserved in a well-closed vessel for use. To prepare chlorine, a sufficient number of these cubes are placed into a Kipp's generator, hydrochloric acid of sp. gr. 1.124, previously diluted with an equal volume of water, being added to decompose the chlorinated lime with liberation of chlorine. The acid need not be chemically pure, but must be free from sulphuric acid, which would cause a crystallization of gypsum. The gypsum introduced with the chlorinated lime, on the other hand, does not interfere. It simply settles to the bottom of the vessel as a dense powder, and forms a layer of small volume. —Arch. d. Pharm., April 1887, 312–313; Ber. d. D. Ch. Ges. 1887, 84.

Dr. F. Hoffmann observes that the above treatment has led manufacturers to introduce into the market numberless varieties of often expensive apparatus for the production of the mixture of the two gases. He suggests as a simple apparatus for the preparation of the gases the one constructed as shown by the accompanying cut (Fig. 21). It is composed of the glass cylinder *a*, or a corresponding wide-necked bottle; the cylinder of an ordinary stout glass syringe is introduced into the opening of the larger cylinder by means of the perforated rubber stopper *b*. A bent tube is introduced in the same manner into the large opening of the syringe-tube, and this bent tube is connected with the gum-bag by means of a rubber tube, the stop-cock *c*, being replaced by an ordinary clamp.

Two of these apparatus are required, the one for carbonic acid, the other for sulphuretted hydrogen. For the first, the outer cylinder is filled with dilute hydrochloric acid, the inner with pieces of marble, the latter being raised or lowered as may be required for the generation or interception of the gas. For sulphuretted hydrogen the outer cylinder is charged with dilute sulphuric acid, the inner with ferrous sulphide. The gases are mixed in the proper proportion, as wanted for use.—Pharm. Rundschau, June 1887, 138–139.

FIG. 21.

Apparatus for Generating Gases.

Chlorinated Lime—Contamination with Manganese.—Mr. Alexander Shaw, having prepared some liq. sodæ chlorinatæ, found it, on standing over night, to assume a beautiful pink color. He was at first inclined to attribute this coloration to an impurity in the bicarbonate of sodium, which he had employed instead of the carbonate, but subsequent experiments proved the presence of manganese, probably as chloride, in the chlorinated lime. The development of the pink color is not observed when, as is usual, carbonate of sodium is employed; but in the presence of bicarbonate the additional molecule of carbonic acid decomposes some of the hypochlorite; the free hypochlorous acid slowly oxidizes the manganese oxide into permanganic acid, and thus gives rise to the pink coloration of the liquor.—Pharm. Jour. and Trans., March 26, 1887, 785–786.

Chlorinated Lime—Quality of the Package Article.—Mr. Robert C.

Bicknell has examined chlorinated lime put in glass and in paper boxes lined on the inside with rosin. One specimen put up in glass was found to contain 35 per cent. of available chlorine; the high price of the container as compared with the cost of the contents is regarded as the only objection to this form of package. A number of paper packages were examined, the top layers of which were generally found more or less deficient in chlorine strength, while in the interior from 30 to 33 or 35 per cent. of available chlorine was found, and in a number of partly broken packages over 20 per cent. Some of the packages assaying 30 and 32 per cent. of chlorine had been kept more than a year.—Amer. Jour. Pharm., Dec. 1886, 593.

Hydrochloric Acid—Toxicological Determination.—The presence of hydrochloric acid naturally in the stomach renders its determination in cases of poisoning by it peculiarly difficult. Mr. Vitali has subjected the different proposed methods to critical examination, and recommends the following as answering the purpose well: The intestines being finely cut up, are, together with their liquid contents, macerated for 24 hours in 8 times their volume of alcohol, transferred to a filter, and washed until the washings no longer become turbid with nitrate of silver. The alcohol is distilled off and then fractioned, the first portion being examined for ethyl-chloride, and the acid portion, which becomes turbid with nitrate of silver, being collected separately. The residue of the distillation is subjected to destructive distillation, and the products which contain chloride of ammonium are collected, evaporated to dryness, washed with alcohol, and the chloride of ammonium crystallized from water. In case in either of the three fractional products thus obtained more than traces of chlorine compounds are found, it may be assumed that hydrochloric acid has been introduced into the stomach as such.

The intestines after extraction with alcohol are digested 24 hours with water, the extraction is evaporated to syrupy-consistence, mixed with 8 times its volume of alcohol, and the precipitate collected and washed with alcohol. The precipitate, as well as the residue of evaporation of the alcoholic solution and washings, are separately incinerated with soda, and the ash is tested for chloride of sodium, which, if present in considerable quantities, points to poisoning by hydrochloric acid. Mr. Vitali accepts the view of Schiff, according to whom the normal hydrochloric acid of the stomach is present in the form of acid compounds with organic constituents, principally with pepsin.—Arch. d. Pharm., March 1887, 225; from L'Orosi, Nov. 1886, 361.

Hydrochloric Acid—Removal of Arsenic.—The recommendation of Beckurts to add to crude hydrochloric acid some ferric chloride and subject to distillation, rejecting the first 30 per cent. and collecting the next portion of 60 per cent. of distillate, thereby securing an acid free from arsenic, is objected to by Dr. H. Hager, on the ground that if the distillation is carried on somewhat rapidly, the acid is liable to be contaminated with iron. He recommends as a better method—one that secures absolute freedom from arsenic, and is at the same time economical—that the crude acid be digested with copper scraps and then rectified by distillation. The arsenic forms a compound with 5 atoms of copper, which adheres so closely to the copper scraps that the simply decanted acid is completely free from it. As a precautionary measure it is advisable to digest the acid after the first decantation, a second time with copper, then to distill. If maceration in the cold is preferred, this will require about 36 hours; digestion requires from 3 to 4 hours. Any ferric chloride in the crude acid is converted into ferrous chloride by the copper, and there is no danger that it will pass over with the acid vapor. —Arch. d. Pharm., Aug. 1886, 668; from Pharm. Ztg., 31, 401.

Hydrochloric Acid—Removal of Arsenic.—Referring to Dr. Hager's observations respecting his method of removing arsenic completely from hydrochloric acid by the addition of ferrous chloride, etc., Mr. H. Beckurts observes that inasmuch as the acid is intended for forensic experiments in which the absence of arsenic must be assured, and not for pharmaceutical purposes, it is a matter of indifference whether or not the acid contains traces of iron, provided the arsenic is absent. This is assured by the method recommended by Beckurts. If it is desired to obtain an acid that is completely free from arsenic as well as iron and other impurities, the following method of Mr. R. Otto will assure this result: the method being dependent on the observation that the last traces of arsenic are completely removed from the hydrochloric acid by treatment with H_2S, if some substance other than arsenic is present in the acid that will give an insoluble precipitate with the gas. This condition obtains in the crude acid of commerce, which is diluted to a sp. gr. 1.12, and a current of H_2S, which may be developed from ordinary material, is passed through under constant agitation until the acid just acquires its odor. It is then allowed to stand 24 hours in a closed vessel at 30 to 40°, H_2S passed again through the acid until it acquires its odor permanently, allowed to clarify by standing, decanted clear, the last portions being filtered, and then subjected to distillation. The first portion, containing traces of H_2S, as well as the last $\frac{1}{10}$ of the acid, are rejected. The intermediate portion is perfectly pure and free from arsenic. By the action of the H_2S any iron present is converted into the ferrous form, and consequently non-volatile.—Arch. d. Pharm., Sept. 1886, 760 and 807; from Pharm. Ztg.; see also Ber. d. D. Chem. Ges., xix, 1883.

Hydrochloric Acid—Determination of Tin Present.—Dr. Hager draws attention to the importance of assuring the absence of tin in hydrochloric acid used for the determination of arsenic by the Kramato method, inasmuch as an acid containing tin will produce a reaction upon brass which is very similar to that of arsenic. To determine the presence of tin in hydrochloric acid, 15 to 20 cc. are diluted with 2 volumes of water, and a bright plate of zinc is immersed in the dilute acid for one hour. In the presence of tin the plate of zinc will be coated with a dull greyish layer. The plate is removed, dipped into distilled water, the adhering water shaken off as much as possible, and dried over the chimney of the small flame of a petroleum lamp. If the coating is tin it remains grey, but if a trace of arsenic is present it becomes black-grey or black. The coating is scraped off with a knife onto smooth paper, the scrapings are introduced into a test tube, and 4 to 5 drops nitric acid (30 per cent.) are added and heated. The presence of tin is established by the production of a turbid solution, which does not become clear on the further addition of 5 drops of nitric acid. Upon standing a dust-like deposit is formed.—Arch. d. Pharm., Sept. 1886, 760; from Pharm. Centralh., xxvii, 338.

Hydrochloric Acid—Detection of Hydrobromic Acid.—Dr. Hager recommends the following method for detecting the presence of hydrobromic acid in officinal hydrochloric acid: 6 cc. of the 25 per cent. hydrochloric acid (to which percentage it must be reduced if stronger) are placed in a test tube of about 1.2 cm. diameter, 0.06 gram of chlorate of potassium is added and dissolved by gentle shaking; from 3–4 cc. of bisulphide of carbon are now introduced and gently mixed by alternately reversing the position of the closed test tube. The bisulphide of carbon assumes a yellow color, which it retains for 12 hours in the presence of bromine, but loses in 10–15 minutes if that element is absent. —Pharm. Ztg., xxxii (1887), 98.

Crude Hydrochloric Acid—Presence of Sulphuric Acid.—Attention is drawn in "Chem. Industrie" to the presence of variable and often considerable quantities of sulphuric acid in commercial crude hydrochloric acid, which renders the usual test of strength by ascertaining the sp. gr. fallacious. The following shows the results of some experiments made with different samples of acid:

Degrees Baumé, noted	Grams of free sulphuric acid present in 1 liter calculated as:		Degrees Baumé, corrected.
	Anhydride.	*Acid of 66°.*	
18.2	0.528	0.647	18.0
20.4	9.629	11.796	17.0
20.9	12.233	14.985	16.5
21.0	18.160	22.346	16.5
22.4	34.228	41.929	16.5

—Arch. d. Pharm., Aug. 1886, 669; from Pharm. Centralh., xxvii.

BROMINE.

Hydrobromic Acid—Preparation.—J. S. recommends the following method as giving better results than some of the methods that have heretofore been recommended for the preparation of medicinal hydrobromic acid: 60 grams of bromide of potassium, 50 grams of sulphuric acid, 25 grams of water, and 2 grams of amorphous phosphorus, are subjected to distillation; the distillate is treated with a little bromine in order to convert any sulphurous acid produced into sulphuric acid, the sulphuric acid is precipitated by carbonate of barium, and the acid, after decantation from sulphate of barium, is rectified. The resultant product weighs, according to the author, 150 grams (? Rep.), and contains 25 per cent. of hydrobromic acid.—Arch. d. Pharm., May 1887, 404; from Pharm. Ztg., 1887, 163.

Bromides—Possible Failure to Detect the Presence of Chlorides.—Mr. G. Vulpius draws attention to the possible failure to detect the presence of chloride of sodium or ammonium in admixture with bromide of sodium or ammonium, if certain proportions of bromide of potassium are present at the same time, the method of testing contemplated being that of the Germ. Pharm., which designates the maximum quantities of $\frac{1}{10}$ normal silver solution necessary to completely precipitate 0.3 gram of the bromide under examination. In the presence of a certain proportion of bromide of potassium, the equivalent of the mixture may vary sufficiently to completely cover the presence of the chloride.—Pharm. Centralh., 1887, 133.

IODINE.

Iodine—Modification of the Method of Extraction from Kelp.—The usual method of liberating the iodine from the mixture of salts obtained from kelp consists in treating the mixture with manganic oxide—or bichromate of potassium—and sulphuric acid. The method has the disadvantage that owing to the simultaneous decomposition of the chlorides and bromides present, chloride and bromide of iodine are formed along with the latter. Mr. Vitali has now found that this trouble is obviated if sulphuric acid is not used, and the decomposition is effected in the dry way by heating the salt mixture with bichromate of potassium to redness. Only the iodine compounds are decomposed under these conditions. The author also recommends that the kelp be soaked in a solution of carbonate of potassium before reducing it to ash; the other iodides being thus converted into iodide of potassium, which is not volatile, and loss of iodine is thus prevented.—Arch. d. Pharm., Jan. 1887, 89; from L'Orosi, Oct. 1886, 325.

Iodine—Determination of the Titre of its Solutions.—W. Kalmann recommends the following method as more simple than that by means of hyposulphite of sodium. A measured quantity of the iodine solution is diluted, in a beaker, with water, and treated with sulphydric acid until decolorized. To the milky fluid a little methyl orange is added, and the hydriodic acid is determined by titration with $\frac{1}{10}$ n. soda solution until the solution turns yellow. 1 cc. of the $\frac{1}{10}$ normal solution of soda corresponds to 0.0127 grams iodine.—Ber. d. D. Chem. Ges., xix, 728.

Iodine.—Determination in small quantities of *Laminaria*, which see under "Materia Medica."

Iodine.—Action on *Volatile Oils*, which see under "Organic Chemistry."

Iodide of Sodium—Advantages over Iodide of Potassium.—A leading article in the British Medical Journal thus sums up the advantages of iodide of sodium over iodide of potassium: (1) It can be used therapeutically for almost all, certainly the chief purposes for which potassium iodide is used, and with similar beneficial results. (2) Sodium iodide is more assimilable than the iodide of potassium, both locally to the digestive organs and to the general system. (3) Many of the local and general undesirable effects which are produced by potassium iodide do not follow the use of sodium iodide.—Amer. Jour. Pharm., Dec. 1886, 623; from N. Y. Med. Monthly.

FLUORINE.

Fluorine—Atomic Weight.—In connection with his experiments on the double salts of difluoride of manganese and fluoride of ammonium (see below), Mr. O. T. Christensen has determined the atomic weight of fluorine. The salt was treated with iodide of potassium and hydrochloric acid, and iodine liberated by the fluorine titrated with hyposulphite of sodium. The results prove the equivalent to be 19 (average = 18.94), O being 16.—Arch. de Phar., Sept. 1886, 803; from Jour. f. prakt. Chem. xxxiv, 41.

Fluorine—Compounds with Chromium and Manganese.—Mr. O. T. Christensen has prepared and studied a series of double fluorides.

Fluoride of Chromium and Potassium.—$6KF.Cr_2F_6$, was obtained by melting together dry hydrated chromic oxide in a platinum crucible with fluoride of potassium, and lixiviating the mass with water containing hydrofluoric acid, which leaves the compound in form of a green crystalline powder, which is practically insoluble in water. A second compound,

Fluoride of Chromium and Potassium (*b*), having the formula $4KF.Cr_2F_6+2H_2O$, is obtained by dissolving chromic oxyhydrate in hydrofluoric acid, filtration and precipitation of the filtrate with a solution of pure fluoride of potassium. It is obtained as a handsome green compound, also nearly insoluble in water.

Fluoride of Manganese and Ammonium, $4NH_4F,Mn_2F_6$, is obtained by dissolving manganous oxide in hydrofluoric acid by the addition of a concentrated solution of fluoride of ammonium. It is a red, crystalline salt. By substituting fluoride of sodium for the ammonium salt and evaporating the mixture to superficial crystallization on cooling,

Fluoride of Manganese and Sodium, $4NaF,Mn_2F_6$, separates in form of a red crystalline salt.—Arch. d. Pharm., April 1887, 357; from Journ. f. prakt. Chemie, xxxv, 161.

Fluoride of Hydrogen—Electrolysis.—Mr. Moissan subjected anhydrous fluoride of hydrogen to electrolysis in a U shaped platinum tube at — 50°. He obtained hydrogen at the negative pole, while at the positive pole a gas was developed, which was absorbed by mercury with formation of fluoride of mercury. Water is decomposed by it with formation of ozone, phosphorus and silicon are inflamed, chloride of calcium is decomposed with liberation of chlorine, and sulphur is liquefied by the heat of reaction. Further experiments are being made to determine the nature of this gas, which possibly is fluorine.—Arch. d. Phar., Sept. 1886, 763; from Jour. Phar. Chim., xiv, 113.

Hydrofluoric Acid—Solidification.—Mr. K. Olszewski obtained solid anhydrous hydrofluoric acid by heating fused hydrofluoride of potassium in a platinum retort, collecting in a platinum receiver in which, by cooling with ice and salt, it formed a liquid. On reducing the temperature to—102.5°, this liquid congealed to a crystalline translucent mass which, on further reduction of temperature, became white and opaque. While anhydrous hydrofluoric acid does not attack glass, the presence of the least trace of water will cause corrosion. To prevent this the author had recourse to paraffin, a thin coating of which, while translucent, protects the glass completelv.—Arch. d. Pharm., Nov. 1886, 981; from Monatsh. f. Chem., 7, 371.

Hydrofluoric Acid—Alleged Innocuous Character.—Mr. Chevy asserts that the inhalation of hydrofluoric acid is not only not injurious, but that it is absolutely beneficial. He states that when inhaled with 1500 parts of air it has given excellent results in tuberculosis and diphtheria. It has been found a powerful antiseptic and antiferment, preserving urine, milk, meat and meat broth from putridity and fermentation, and has been used by preference with the best results for bandaging wounds.—Arch. d. Pharm., 1886, 552; from Jour. Pharm. Chim., 1886, 269.

PHOSPHORUS.

Phosphorus—Agents to Prevent Phosphorescence.—In the determination of phosphorus by Mitscherlich's method, the phosphorescence of the element is prevented by the presence of ether, oil of turpentine, bisulphide of carbon, and other volatile substances. Messrs. Polstorff and Mensching have now found that *mercurial salts* will answer the same purpose, mercurous salts being quite as active as mercuric. Bernbeck also has found that *sulphate of copper* has the property of destroying the luminosity of phosphorus, and Mankiewicz finds this property also in *carbolic acid* and its sodium compound. Indeed, it seems probable that all phenols possess this property.

Phosphorus—Detection in a Cadaver after Three Months.—Mr. Theodore Poleck contributes a paper in which he details at length the method of examination pursued by him for determining phosphorus in a human cadaver three months after the death of the poisoned person.—See Arch. d. Phar., March 1887, 190–216.

Hypophosphorous Acid—Objection to the Use of Oxalic Acid in its Preparation.—Mr. George Lunan has examined two samples of concentrated and two samples of 10 per cent. hypophosphorous acid, one of the latter having been prepared by him by decomposing 17 grams of the calcic salt with 12.6 grams of pure recrystallized acid, whilst the others were procured from reputable houses. He found in each case a certain quantity of calcic oxalate, which is, therefore, while in the freshly precipitated condition, dissolved by the acid. Free oxalic acid was absent, calcic hypophosphite being present to a greater or less extent. A trace of phosphoric acid was present in one of the samples of concentrated acid. The sp. g. of the acids was 1.1332, 1.1367, 1.0442 and 1.0353 respectively, the percentages of hypophosphorous acid, in the same order, being 29.12, 29.95, 8.87 and 8.07. The sample containing 8.87 per cent. was that made by the author, and should have contained 10 per cent. of acid. It seems, therefore, that by the lime and oxalic acid process, which was originally recommended by the late Prof. Procter, and which appears to be generally followed, the acid cannot be prepared free from calcic oxalate. The author suggests a 20 per cent. acid as being more generally useful, to be prepared by decomposing 29.5 grams of the pure barium hypophosphite, dissolved in 120 cc. of distilled water, with 10 grams of H_2SO_4, specific gravity 1.843, filtering, washing to make the filtrate measure about 150 cc., and concentrating until the fluid weighed 65 grams, when it should contain 20 per cent. H_3PO_2.—Phar. Jour. and Trans., March 19, 1887, 773.

Hypophosphites.—Unsatisfactory condition for the preparation of the officinal *syrup of hypophosphites*, which see under "Pharmacy."

Tetroxide of Phosphorus—Formation and Characters.—Messrs. T. E. Thorpe and A. E. Tutton have examined the product formed by combustion of phosphorus in a limited supply of air, with special reference to the statement of Reinitzer that when dissolved in water, under certain conditions, it gives a solution of a light-yellow color, and that after dialysis this liquid is found to contain a body of perfectly neutral reaction, and coagulates on being heated to 80° after addition of a few drops of a mineral acid. The authors, having repeated Reinitzer's experiments, are unable to confirm the existence of this so-called colloidal modification of oxide of phosphorus. The yellow color is due to the presence of the suboxide of phosphorus in extremely finely divided powder, which can be removed by repeated filtration. The colorless solution has a strong acid reaction, shows no turbidity on heating to 80°, and gives all the reactions of phosphorous acid. When the mixed products of the combustion of phosphorus are heated *in vacuo* to about 290–300°, suboxide of phosphorus is formed, together with a sublimate of colorless, transparent, rhombic crystals. These crystals sublime *in vacuo* at 180°, and are extremely deliquescent; they dissolve in water with formation of a solution of orthophosphoric and phosphorous acids, and on analysis give numbers agreeing with the formula P_2O_4. The authors are inclined to the belief that this substance is the true *tetroxide of phosphorus.*—Pharm. Jour. and Trans., Nov. 20, 1886, 421.

Bibasic Phosphates—Formation.—Mr. Jolly has investigated the nature and formation of bibasic phosphates. It is well known that by double decomposition a series of insoluble phosphates are obtained upon the addition of a metallic salt to bisodium phosphate. The author finds that according to the nature of the metallic salt, the reaction results in the formation of a trimetallic phosphate, as in the case of silver, and acid is liberated, or the product of the reaction is a crystalline bimetallic phosphate, as in the cases of calcium, strontium, barium, etc. It is true that in the latter case, also, bimetallic salts are first formed, and the liquid acquires an acid reaction to litmus; the reaction is however neutral to methyl-orange, and the liquid therefore contains a monometallic phosphate. Between this and the precipitated trimetallic phosphate reaction takes place, and the bibasic phosphate, in crystalline condition, is ultimately produced, the rapidity of the change depending on the degree of dilution of the solution.—Arch. d. Pharm., April 1887, 361; from Jour. de Pharm. et de Chim., 1887, xv, 93.

Phosphate of Calcium.—A new compound with gummic acid. See *Gummo-Phosphate of Calcium* under "Organic Chemistry."

Phosphoretted Hydrogen—Solidification.—Mr. K. Olszewski finds that phosphoretted hydrogen is liquefied with great ease at 90° by passing it through a tube cooled by means of aethylene to —102.5°. By further reduction of the temperature, by the removal of the aethylene with a vacuum pump, the PH_3 congeals, forming a white crystalline mass, when the temperature is reduced to—133.5°.—Arch. d. Pharm., Nov. 1886, 981; from Monatsh. f. Chem. 7, 371.

Pentafluoride of Phosphorus—Preparation.—Mr. Moissan finds that the method of Thorpe for the conversion of trifluoride of phosphorus into the pentafluoride does not yield a pure product, and therefore proceeds as follows: Bromine is treated with trifluoride of phosphorus in excess at—15° C. An amber-yellow liquid is formed having the composition PFl_3Br_2. This compound gradually splits according to the following equation:

$$5PFl_3Br_2 = 3PFl_5 + 2PBr_5.$$

The pentafluoride is gaseous at the ordinary temperature, non-inflammable, fumes in the air, has a pungent odor, and is absorbed by water. It is liquid under a pressure of 12 atmospheres, at 13° c. The fluoride does not affect glass nor silicate in general. Its sp. g. is 4.5.—Arch. de Phar., July 1886, 603; from Jour. Phar. Chim., 1886, 301.

BORON.

Boric Acid—Action on Microbes.—Dr. R. G. Eccles, in reply to a query respecting the presence of microbes in saturated solution of boric acid, reports to the N. Y. State Pharmaceutical Association that such solutions may contain living microbes, but that these cannot multiply, and becoming sickly and puny they become harmless. Even a 2 per cent. solution checks their power to multiply, and there is, therefore, no doubt as to the value of this acid as an antiseptic. As a disinfectant it is valueless, and displays no sign of germicidal power.—Proc. N. Y. State Phar. Assoc., 1887, 178.

Boric Acid.—Detection of Iron in the Powder; see under *Ferrum.*

Boric Acid.—Proposed addition to *Solution of Citrate of Magnesium*, which see under "Pharmacy."

Borax—Historical Notes Respecting its Occurrence in California.—Mr. Arthur Robottom has contributed an interesting paper on the history of California borax to "Chemical News" (Nov. 12, 1886, 245), which is reproduced in Amer. Jour. Pharm., Feb. 1887, 80–86.

SILICON.

Silicon—Atomic Weight.—Messrs. T. E. Thorpe and J. W. Young have attempted to redetermine the atomic weight of silicon by estimating the quantity of silicon yielded by decomposing known weights of tetrabromide of silicon by means of water. The result of the experiments was to give the atomic weight of silicon as 28.332 if H = 1.—Pharm. Jour. and Trans., April 30, 1887, 895.

CARBON.

Animal Charcoal—Determination of Decolorizing Power.—Mr. G. Laube recommends a method for the determination of the decolorizing power of animal charcoal, which is essentially as follows: A sample of charcoal, of good quality, being selected, this is dried at 110°, reduced to very fine powder, and preserved as "normal charcoal." A "normal color" is prepared from 50–100 grams of caramel, 100 cc. alcohol and sufficient water to make 1000 cc. To make the test, 5 grams of the "normal charcoal" are mixed with 200 cc. of water, heated in a flask to boiling, and 10 cc. of the normal solution are added and the heating continued for 10 minutes at a gently boiling temperature, avoiding loss of water by means of a reverse condenser. The liquid is then filtered. The color of the filtrate being observed, 200 cc. of water are taken and "normal color" is measured into this until a colored fluid is produced having as near as possible the shade of that treated with animal charcoal. Supposing 2.1 cc. to be required, then the charcoal has absorbed 7.9 cc. of the "normal color." Having established this standard, the sample of charcoal to be examined, of the required dryness and division, is treated in precisely the same way. Supposing that 4.5 cc. of the "normal color" is required in this case to produce a liquid of the same intensity or shade of color as that produced by the charcoal sample, then the latter has absorbed only 5.5 cc. of the normal color, or 70 per cent. of the quantity absorbed by the "normal charcoal."—Arch. d. Pharm., Feb. 1887, 133; from Pharm. Centralh., 1886, 614.

Carbonic Acid—Determination in Air.—Roster describes a modification of the apparatus hitherto in use for the determination of carbonic acid in atmospheric air, whereby he not alone saves time, but secures very accurate results. The method consists in passing the air through a solution of potassa containing 200 grams per liter, liberating from this the carbonic acid by sulphuric acid of s. g. 1.650, and measuring the volume of gas thus generated. In principle the method corresponds to that of Levy, Müntz and Aubin, the distinction being mainly in the improved apparatus, which are described with illustrations in L'Orosi, 1886, 109.

Liquid Carbonic Acid—Technical Uses.—Mr. Adolf Convert has contributed an interesting paper on the technical uses to which liquid carbonic acid is now being put, and the advantages derived from the substitution of the acid in this form, which see in Pharm. Rundschau, April 1887, 84–88.

Bisulphide of Carbon—Non-toxic Character.—According to Mr. Sapelier, bisulphide of carbon, if perfectly pure, does not possess toxic action. On the other hand, it must not be administered admixed with alcohol, or to persons who partake of alcoholic liquids, since in the presence of alcohol sulphydric acid is generated and the toxic effect thus produced. It may be given internally, as an antiseptic, in form of a saturated aqueous solution, obtained by shaking bisulphide of carbon with water, in daily doses of from 6 to 20 tablespoonfuls. Externally the author applies it on cotton wadding, protected by gummed cloth, as a substitute for mustard plaster: the desired effect being usually produced after 30 seconds.—Arch. d. Pharm., 1886, 554; from Jour. Pharm. Chim., 1886, 194.

Chloride of Carbon—Action Upon Oxides.—Mr. Lothar Meyer has observed that chloride of carbon serves in some cases excellently for the conversion of oxides into chlorides. The oxide is placed in a glass or porcelain tube, which is heated according to necessity. A current of some indifferent gas is first passed through the oxide to expel air, and then the chloride of carbon. Alumina was in this manner readily converted into chloride of aluminium, and the chlorides were in the same manner obtained from magnesium, beryllium and cerium oxide. On the other hand, the anhydrides of boric, silicic and titanic acid, as well as zirconium oxide, were not convertible, though possibly in these latter cases a temperature sufficiently high for their conversion could not be obtained.—Arch. d. Pharm., May 1887, 451; from Ber. d. D. Chem. Ges., 1887, 681.

CYANOGEN COMPOUNDS.

Hydrocyanic Acid—New Reaction.—The following new reaction for hydrocyanic acid is given in "Pharm. Post" (xix. p. 740): To the suspected liquid is added nitrite of potassium and ferric chloride acidulated with sulphuric acid and heated to near the boiling point. After the mixture has cooled the iron is precipitated by ammonia and filtered. The filtrate is tested for potassium nitro-prussiate, with colorless solution of sulphide of ammonium. In a dilution of 1 part of hydrocyanic acid to 312,500 parts of water a distinct bluish-green coloration is produced.

Hydrocyanic Acid—Detection.—Mr. Vortmann recommends the following delicate test for the presence of hydrocyanic acid: Nitrite of potassium and solution of ferric chloride are added to the suspected liquid, which is then acidulated with a few drops of diluted sulphuric acid and heated to near boiling; after cooling the iron is precipitated by ammonia, the liquid is filtered and tested for nitro-prusside with colorless sulphide of ammonium. A distinct bluish-green color is developed under these circumstances in the presence of 1 part of hydrocyanic acid in 300,000 parts of water.—Arch. d. Pharm., Nov. 1886, 936; from Zeitschr. d. Oest. Ap. Ver. xxiv, 392.

Hydrocyanic Acid.—Determination in *Bitter Almond Water*, which see under "Pharmacy."

Cyanide of Ammonium—Electrolytic Method of Preparation.—According to Figuier, cyanide of ammonium is produced synthetically by passing the electric spark through a mixture of 1 vol. formen and 2 vols. nitrogen, the formation being as follows: $CH_4 + N_2 = CN.NH_4$.—Arch. d. Pharm., July 1886, 602; from Jour. Pharm. Chim., 1886, 314.

Ferrocyanide of Sodium—Composition.—The investigations of Mr. L. Pebal prove that ferrocyanide of sodium does not contain 12 mol. of water of crystallization, but 10 mol., its formula being properly as follows: $Na_4FeCy_6 + 10\ H_2O$.—Arch. d. Pharm., Aug. 1886, 715; from Liebig's Ann. Chem., ccxxxiii, 165.

Sodium Sulphocyanide—Preparation and Uses.—This salt, which is also known under the name of *sulphocyanate*, *thiocyanate*, and *rhodanate of sodium*, has been found by Dr. Paschkis to have an action similar to that of strychnine, but less rapid, producing in frogs prolonged tetanic convulsions with inhibition of the respiratory and cardiac movements. Injected into the arteries of mammals, a marked increase in the blood pressure is produced. It is prepared by neutralizing thiocyanic acid with sodium carbonate, evaporating the liquid carefully by the aid of a water bath or over sulphuric acid, and recrystallizing the dry residue from alcohol. The salt forms white or colorless rhombohedric crystals, which are very deliquescent and freely soluble in water and in alcohol. Its composition is expressed by the formula NaSCN. The aqueous solution does not produce any precipitate with barium chloride; it imparts to ferric salts a deep blood-red color which is not affected by hydrochloric acid, but disappears on the addition of corrosive sublimate.

Potassium sulphocyanate is more generally met with than the sodium salt, and may probably have the same, or at least an analogous action. As early as 1818, A. Vogel (*Schweigger's Journal*, xxiii.), called attention to the poisonous narcotic effects of the potassium salt.—Amer. Jour. Pharm., Nov. 1886, 533.

POTASSIUM.

Potassium—Practical Test of Identity.—Mr. C. W. Teeter recommends the following test for determining the presence of small percentages of potassium: In a suitable dish heat the substance supposed to contain potassium, and carefully add sulphuric acid until no further effervescence is caused, continuing the heat until sulphuric-acid fumes begin to rise, then remove. Now add freshly prepared milk of lime magma until the mixture remains alkaline. Filter, adding sufficient water through the filter to exhaust all soluble salts, and render the filtrate slightly acid with hydrochloric acid; then add basic chloride until no more precipitate forms, and evaporate to dryness. Extract the residue with a small portion of 75 per cent. alcohol (alcohol 3 vols., water 1 vol.), and filter into a test tube. To this add double its quantity of alcohol solution of nitrophenic acid (1:50), when, if potassium is present, yellow prismatic needles of nitrophenate of potassium will soon appear. With careful manipulation, avoiding excess of both solvent and reagent, eight milligrams of sulphate of potassium yield an abundant crop of crystals, easily and certainly recognized without the aid of a lens.—Amer. Drug., May, 1887, 81.

Potassa—Two New Hydrates.—Hitherto only one hydrate of potassium, $KOH+2H_2O$, has been known. Mr. Ch. Göttig has now obtained and describes two new hydrates, the one having the formula $2KOH+5H_2O$, the other the formula $2KOH+9H_2O$. Both are obtained under certain conditions from the solutions of potassium hydrate in strong (96.8%)

alcohol. The first forms long, fine, felty crystals; the second large columnar crystals —Arch. d. Pharm., June 1887, 540; from Ber. d. D. Ch. Ges., 1887, 1094.

East Indian Saltpetre—Impurities.—Mr. E. Claassen has determined the percentage of water, of mechanically admixed impurities, of sulphuric acid and of chlorine in nine samples of East Indian saltpetre, as follows:

	1.	2.	3.	4.	5.	6.	7.	8.	9.
Water	1.855	1.840	0.380	1.400	0.530	0.960	2.360	1.100	1.400
Impurities (sand, etc.) . . .	0.080	0.147	0.100	0.110	Trace.	0.105	0.130	0.113	0.150
Sulphuric Acid	0.017	0.137	Trace.	0.022	Trace.	. .	. .	. .	0.316
Chlorine	0.079	3.807	3.200	2.080	4.035	1.429	1.662	0.288	1.203

—Pharm. Rundsch., 1886, 272.

SODIUM.

Sodium—New Process of Preparation.—Mr. Hamilton Y. Castner describes a new process devised by him for the reduction of soda and other alkalies to the metallic state, which not alone secures a yield of 90 per cent. of the available metal (against 30 per cent. as obtained under the most favorable conditions by the methods generally employed), but excels in simplicity, and by appropriate arrangement of the apparatus can be made practically continuous. In the new process the author does away with the use of lime and excess of carbon, using in their place a "carbide" of iron, obtained by cooking a mixture of tar and iron (previously reduced in a fine state of division by carbonic oxide or hydrogen). From experience, such proportions of tar and iron are used as will produce, when the mixture is coked, a heavy mass of metallic coke, having about the composition of iron seventy per cent. and carbon thirty per cent., equivalent to the formula FeC_2. This mechanical compound, after being ground, is ready for use, and consists of fine particles of iron coated with carbon, fully answering the purposes of a true carbide. The reducing substance, due to its composition and gravity, remains below the surface, and is therefore in direct contact with the fused alkali. He prefers the use of caustic soda in the preparation of sodium on account of its fusibility, and with it mixes such quantity of the so-called "carbide" that the carbon contained in the mixture shall not be in excess of the amount theoretically required to reduce all the soda to sodium, according to the following reaction:

$$3NaHO + FeC_2 = 3Na + Fe + CO + CO_2 + 3H,$$

or to every 100 pounds of pure caustic soda, fifteen pounds of "carbide," containing about twenty-two pounds of carbon, is added. The treatment of this mixture is carried on in large cast-iron crucibles in a furnace, the general arrangements of which are as follows: The heating space of the furnace is divided into separate chambers, the dimensions of the same depending upon the size of the crucibles to be heated, and the number of these compartments is in proportion to the capacity of production desired for the furnace. An aperture is provided in the bottom of each chamber, through which the crucible may be raised by mechanical means into its position in the furnace. The necessary cover for the crucible is fixed stationary in each chamber, and from this cover projects the tube to the outside of the furnace into the receptacle for the condensation of the metallic vapors. When operating, the crucibles are charged with the mixture, made as before described, placed upon the lift, which is situated directly below the aperture made in the bottom of the chamber, and raised into the furnace. The edges of the covers are made convex, while the edges of the crucibles are concave, so that when the crucibles are raised the edges come together and, being held from below, form a tight joint, preventing the exit of gas and vapor, excepting through the tube provided from the cover. Gas, which is used as a fuel in connection with heated air, is allowed to enter the chamber, after the crucible containing the charge is in place, and the reduction and distillation commences as soon as the crucible contents have reached the temperature of 1000° C., the sodium being reduced in the crucible and distilled therefrom into the condenser, by passing through the tube projecting from the crucible cover. As soon as the operation is finished, the crucible is lowered, and a new one containing a fresh charge is raised in its place, while the crucible just removed is cooled, cleaned and re-charged. By the old process, the heat required to penetrate to the centre of the refractory charge and reduce the soda there situated, in addition to the heat absolutely needful to bring about reduction, necessitates the use of wrought-iron vessels, and even when these are made small in diameter, which partially removes this great disadvantage of the method, the expensive cylinders are rapidly rendered worthless from the effects of the intense heat.—Amer. Jour. Pharm., Nov. 1886, 541–543.

Sodium—Formation of a New Hydrate.—Mr. Ch. Göttig has obtained a new hydrate of soda by carefully heating a concentrated solution of NaOH in strong alcohol to about 100°. By the partial evaporation of the alcohol numerous aggregations of dense crystals are obtained, which were dried between blotting paper, and have the composition $NaOH + 2H_2O$. These crystals when thrown upon water, move upon its surface in a lively manner very similarly to metallic sodium, and are rapidly dissolved.—Arch. de Pharm., May 1887, 450; Ber. d. D. Chem. Ges., 1887, 543.

Sodium Carbonate—Decomposition on Fusion.—Mr. S. U. Pickering has investigated sodium carbonate in the manner in which he investigated sodium sulphate (1884), with a view to ascertain whether the discrepancies in the numbers given for its heat of dissolution could be accounted for by its existence in two modifications, as in the case of the sulphate. All specimens dehydrated at temperatures below the fusing point of the salt gave identical numbers, but the fused salt gave a result 200 cal. higher; this was traced to the decomposition of the carbonate. The amount of carbonate decomposed on simple fusion was about three per cent.—Phar. Jour. and Trans., Dec. 11, 1886, 480.

Bicarbonates of the Alkalies—Test for the Presence of Monocarbonate.—Mr. E. Kuhlmann states that experiments made in the new chemical laboratory at Kiel to determine monocarbonate in the alkaline bicarbonates of commerce have resulted in the selection of rosolic acid as admirably suited to the purpose. A small fragment of this acid being placed into a solution of bicarbonate of sodium, this liquid remains perfectly colorless even after a quarter of an hour if the salt is pure; but if it contains from 1–4 per cent. of monocarbonate a rose-red color is produced after a few moments, and immediately in the presence of larger quantities rapidly changing them to purple red.—Arch. d. Pharm., Jan. 1887, 72–73.

Bicarbonate of Sodium—Test for the Presence of Carbonate of Ammonium.—Since the introduction of the ammonia process for the preparation of soda, commercial bicarbonate of sodium not infrequently contains carbonate of ammonium. Mr. K. Thümmel finds the test of the Pharm. Germ. indistinct and unreliable, and therefore recommends the corrosive sublimate test. Corrosive sublimate produces in solutions containing less than 1 per cent. NH_4HCO_3, a distinct, white, flocculent precipitate—not simply a turbidity.—Arch. d. Pharm., Nov. 1886, 933; from Ber. v. d. Naturf. Vers., Berlin.

Bicarbonate of Sodium—Contamination with Hyposulphite of Sodium and Arsenic.—Mr. E. Mylius, whose attention was attracted by the bad taste of some effervescent powder prepared with bicarbonate of sodium, was led to examine the latter, and found it contaminated with hyposulphite of sodium. The test for this impurity is readily made. It consists in supersaturating the sodium compound with diluted sulphuric acid, adding some pure zinc, thereby generating hydrogen which reduces the hyposulphite and forms sulphhydric acid. The latter is evidenced by placing a paper saturated with acetate of lead on the test tube, the paper becoming blackened. The presence of hyposulphite led to the suspicion that the bicarbonate of sodium might also contain arsenic, and appropriate experiments revealed the presence of the poison, though, it is true, only in very small quantities.—Arch. d. Pharm., July 1886, 598–599; from Pharm. Centralh., xxvii, 268.

Bicarbonate of Sodium—Contamination with Hyposulphite.—Mr. Th. Wimmel also draws attention to a contamination of commercial bicarbonate of sodium, of English manufacture, with hyposulphite of sodium. Though quite small (0.5 per cent.) the contamination is readily detected, and has probably not previously occurred. At all events no mention of the presence of hyposulphite of sodium in bicarbonate of sodium has hitherto been made (except as above).—Arch. d. Pharm., July 1886, 593–594.

Referring to the test for the presence of hyposulphite of sodium in the bicarbonate suggested by Mr. E. Mylius (see above), Mr. Brenstein remarks that the reaction produced cannot be taken as absolutely indicative of its presence, since other oxides of sulphur, for instance the sulphite, give rise to the same reaction (elimination of HS). He finds a better method to consist in adding several drops of nitrate of silver solution to a 5 per cent. solution of the bicarbonate, to supersaturate the solution with nitric acid, and to heat to boiling. Silver sulphide is thus precipitated in the presence of the smallest traces of hyposulphite.—Arch. d. Pharm., Sept. 1886, 761; from Pharm. Ztg., xxxi, 420.

Bicarbonate of Sodium—Examination of American Samples for Hyposulphite and Arsenic.—In view of the statement of Mr. E. Mylius that some bicarbonates of sodium of European commerce were found contaminated with hyposulphite of sodium and with arsenic, Prof. F. B. Power subjected representative specimens of bicarbonate of sodium of American manufacture to chemical examination, together with one specimen from a well-known German manufacturing firm. He found neither hyposulphite nor arsenic in any of the samples; but a small amount of sulphite was found in two American samples. Mere traces of chlorides were found in three samples, a small amount of ammonia was found in one sample; three samples contained only traces of mono-carbonate, while the three others, all of American manufacture contained about three per cent., one more and two less. The German salt was selected for its alleged purity, and was found to be so. At least one of the American samples corresponded completely with the high-priced German article, while another did very nearly, both American samples being the ordinary commercial article.—Pharm. Rundschau, 1887, 35–37.

AMMONIUM.

Ammonia—Replacement by other Bases.—According to the observations of Messrs. Berthelot and André, the substitution of ammonia by other bases is in many cases not so readily accomplished as is sometimes assumed. The difficulty is particularly great in the instance of the double salts of ammonia with chlorine and magnesium, and with magnesia and phosphoric acid. Neither magnesia nor hydrate of lime are capable by the aid of heat to drive out and replace all the ammonia, only solution of soda, at the boiling temperature being capable of accomplishing this result, and then only after prolonged action. If magnesia has been employed in the endeavor to drive off the ammonia, the difficulty is very materially increased. Recourse must then be had to soda lime, which will also accomplish the complete substitution of the ammonia only at a red heat.—Arch. d. Pharm., Nov. 1886, 983; from Jour. de Pharm. et de Chim., 1886, xiv, 284.

Ammonia—Dilution.—Prof. P. W. Bedford makes some practical remarks on the dilution of ammonia, which are particularly addressed to students of pharmacy.—See Pharm. Rec., Nov. 1, 1886, 355.

Nitrate of Ammonium—Use in the So-called Oxygen Treatment.—Prof. J. U. Lloyd has examined a granular powder which, he is informed, was supplied as one of the agents used in the so-called compound oxygen treatment under the name of

Granular Nitrogen Monoxide.—It proved to be simply nitrate of ammonium, and the patients are therefore treated under the use of this substance with the well-known laughing gas.—Amer. Drugg., June 1887, 101.

Chloride of Ammonium—Reaction with Ferrocyanide of Potassium in Presence of Calcium Salts.—Mr. Th. Salzer observing that apparently pure chloride of ammonia afforded a white turbidity on addition of ferrocyanide of potassium, traced the reaction to the presence of chloride of calcium. The precipitate is crystalline and contains cyanogen, iron, lime and ammonia.—Arch. de Pharm., Aug. 1886, 669; from Pharm. Ztg., 31, 384.

LITHIUM.

Carbonate of Lithium—Test of Purity Based upon Its Solubilities in Water at Different Temperatures.—Prof. F. A. Flückiger discusses the character of carbonate of lithium, and particularly its peculiarity of being less soluble in warm than in cold water. He recommends as a test for its purity (absence of other more soluble salts) that it should require for its solution 70 parts or little more of water at 15°, and that its solution, saturated at 90°, should have the sp. gr. 1.009 at 15°. The latter solution contains 1 p. salt in 111.3 p. water. The solid is distinguished from alkaline carbonate in that it melts readily in a glass tube held in the flame of a spirit lamp, leaving a foliated mass of crystals on cooling. —Arch. d. Pharm., June 1887, 509–515.

CÆSIUM AND RUBIDIUM.

Cæsium and Rubidium—Formation of Double Nitrites with Cobalt.—Mr. Th. Rosenbladt has obtained some interesting double compounds of nitrate of cobalt with the nitrates of cæsium and rubidium, from either of which they are obtained as follows: Equal parts of nitrate of cobalt and acetate of sodium are dissolved in 15 parts of water, boiled, filtered, allowed to cool, and mixed with 20 per cent. of acetic acid. A concentrated solution of nitrite of sodium is now added gradually until the liquid has assumed an orange color, when it is again filtered. The filtrate is now mixed with agitation with the solution of a cæsium (resp. rubidium) salt; the mixture becomes turbid, and after a time deposits double salts having the composition, in the case of cæsium of $3CsNO_2 + Co(NO_2)_3 + H_2O$; in the case of rubidium, of $3RbNO_2 + Co(NO_2)_3 + H_2O$. The cobalt solution must be in excess. Both of the double salts are crystalline, and have a lemon-yellow color; the cæsium salt requires 20100, the rubidium salt 19800 parts of water for solution at 17°.—Ber. d. D. Chem. Ges., xix, 2531.

Rubidium—Presence in Commercial Alum, which see under "Aluminium."

STRONTIUM.

Strontium—Occurrence in Heulandite.—Strontium has hitherto been found principally in the form of carbonate and sulphate in isomorphous admixtures with their corresponding calcium and barium salts, the only other natural source having been Brewsterite-silicate of aluminium, barium and strontium. Mr. P. Jaunash has now found that the Heulandites of Andreasberg contain very considerable quantities of strontium, these being isomorphous mixtures of calcium and aluminium silicate with an analogous strontium compound.—Arch. d. Pharm., June 1887, 539; from Ber. d. D. Chem. Ges., 1887, 346.

Strontium Dihydrate—Question of Existence.—The existence of a dihydrate of strontium having been disputed by Prof. Scheibler, Mr. C. Heyer made a number of experiments which prove that this oxide is formed when water vapor is poured through anhydrous strontia contained in a tube. Dry air being passed through to remove the excess of water, a crystalline powder remains which contains the amount of water corresponding to the formula $SrO,2H_2O$. It has also been disputed that dihydrate of strontium can be completely converted into carbonate by the action of dry carbonic acid. The author finds that passing dry carbonic acid through previously dried dihydrate of strontium, and then heating to 120°, the dihydrate is not alone completely converted into carbonate, but the decomposition is so accurate that the amount of water in the dihydrate can be reliably determined by this means.—Ber. d. D. Chem. Ges., xix, 2684.

Colored Fires.—Mr. E. C. Kennedy has communicated a highly interesting paper on the composition, quality and preparation of ingredients, mixing, products of their combustion, causes of explosion, and desired character of colored fires, which may be consulted in Pharm. Era, April 1887, 101–103.

CALCIUM.

Sulphate of Calcium—Solubility in Solutions of Ammonium-salts.—Mr.

S. Cohn has experimented to determine the solubility of gypsum in solutions of ammonium salts, a question of much importance in analytical operations. Haver-Droeze had shown that the solubility of gypsum in ordinary saline solutions decreases with the concentration of the solution in all instances except in that of nitrate of ammonium, in which its solubility is at first increased and then decreases. Mr. Cohn now finds that this peculiarity is true for the acetates, chlorides and nitrates of ammonium, but not for the sulphates. The chloride, nitrate, and the acetate of ammonium cause an increase in the solubility by double decomposition, forming readily soluble calcium salts. The solubility of the gypsum is greatest in the acetate; then follows the nitrate, and then the chloride. —Arch. d. Pharm., March 1887, 259; from Jour. f. pract. Chem., xxxv, 43.

Calcium and Barium Saccharates.—Chemical constituents, etc. See under "Organic Chemistry."

MAGNESIUM.

Magnesium—Melting Point.—The melting point of magnesium is given in text-books as being near 500°. Mr. V. Meyer, however, finds it to be near 800°.—Arch. d. Pharm., May 1887, 449; from Ber. d. D. Chem. Ges., 1887, 497.

Magnesium—Direct Solubility in Carbonic Acid Water.—Dr. Kappel observes that when pure carbonic acid is rapidly passed through water in which some magnesium wire has been placed, hydrogen is eliminated, and the magnesium is dissolved as bicarbonate. The observation makes the existence of a hydrate of carbonic acid probable. The solution of the magnesium wire is effected with considerable rapidity.—Arch. d. Pharm., May 1887, 448.

Calcined Magnesia — Sulphur a Contaminant—See *Bitter Almond Water* under "Pharmacy."

Magnesium Bromide—Therapeutic Value.—Mr. Joseph W. England draws attention to the therapeutic value of this salt, and gives a formula for a solution (see *Liquores*, under "Pharmacy"). The usefulness of magnesium bromide, in its acceptability and decisive action, seems to reside in the fact that it contains a larger percentage of combined bromine than any other bromide, with the exception of the lithium compound, as the following table of percentages of combined bromine, in various bromides, will show:

	Formula.	Mol. Wt.	Per Cent.
Nickel bromide	$NiBr_2 3H_2O$	271.6	58.76
Potassium "	KBr	118.8	67.17
Zinc "	$ZnBr_2$	224.5	71.09
Iron "	$FeBr_2$	215	74.23
Sodium "	$NaBr$	102.8	77.62
Calcium "	$CaBr_2$	199.6	79.95
Ammonium bromide	NH_4Br	97.8	81.59
Magnesium "	$MgBr_2$	183.6	86.92
Lithium "	$LiBr.$	86.8	91.93

—Amer. Jour. Pharm., Nov., 1886, 531–533.

Talc—Use in Filtration, which see under "Pharmacy."

ALUMINIUM.

Sulphate of Aluminium—Tests for Free Sulphuric Acid.—Dr. Hager recommends Jorissen's test for the determination of *free sulphuric acid* in commercial sulphate of aluminium, as follows: 2 drops of gurjun balsam and 3 cc. of acetic acid are heated in a test tube, of 1 to 1.2 cm. diameter, with agitation. A small quantity of the suspected salt (about 0.25 gram), previously powdered, is now added to the contents of the tube, and mixed by agitation, with gentle heating in case the contents should have become cool. In the presence of traces of free sulphuric acid a light blue color is developed in the course of 10 minutes, whilst larger quantities produce an immediate dark-blue color.

The presence of *uncombined hydroxide of aluminium* is evidenced when the salt fails to produce a clear solution with twice its weight of distilled water, the quantity being indicated by the greater or less turbidity of the solution.—Arch. d. Pharm., Oct. 1886, 852; from Pharm. Centralh., xvii, 440.

Alum—Presence of Rubidium-Alum in the Commercial Salt.—Mr. Theo. Salzer draws attention to the fact that he found commercial potash alum to contain a very large percentage of "rubidium alum" (also small quantities of "cæsium"). He was led to subject the alum to analysis because of its comparatively sparing solubility, the sample under examination requiring 18 parts of water, whereas potassa alum should dissolve in 10½ parts. He attributes the presence of rubidium to the circumstance that much of the alum is now made from lipidolith. The sample contains from 20 to 25 per cent. of rubidium alum.—Arch. d. Pharm., March 1887, 217; from Pharm. Ztg., 1887, 32, 71.

ZIRCONIUM.

Zirconium—Separation from other Metals.—A good method for the separation of zirconium from the last trace of other metals has hitherto not been known. Mr. G. H. Bailey has now found that the separation from iron, titanium, niobium, etc., may be effected by the aid of peroxide of hydrogen. The addition of a tolerably concentrated solution of the latter to the solution of the mixed metals, causes the precipitation of the zirconium as an oxide having the composition Zr_2O_5, whilst the accompanying metals, iron, aluminium, titanium, niobium, tantalum, tin and silicium are not precipitated.—Arch. d. Pharm., July 1886, 633; from Liebig's Ann. Chem., 232, 352.

MANGANUM.

Manganese—Compounds with Chlorine and Fluorine.—Mr. O. T. Christensen confirms the statement of Pickering that by the action of hydrochloric acid on hyperoxide of manganese, at the ordinary temperature, manganic dichloride (Mn_2Cl_6) and not manganic tetrachloride (MCl_4) is formed. He has, furthermore, obtained by the action of hydrofluoric acid upon pure hyperoxide of manganese, manganic difluoride (Mn_2Fl_6) and not $Mn\,Fl_4$. By precipitating the solution with fluoride of potassium he obtained the double salt $4KFl,Mn_2Fl_6 + 2H_2O$, and in an analogous manner the corresponding sodium and ammonium double salts, both of which, however, are anhydrous. All three of these salts are red and are completely decomposed by water.—Arch. d. Pharm., Sept. 1886, 803; from Jour. f. Prakt. Chem, xxxiv, 41.

Manganese—Formation and Characters of Certain Fluorides, which see under "Fluorine."

Manganese—Presence in Chlorinated Lime, which see under "Chlorine."

Peroxide of Manganese—Action of Hydrochloric and Hydrofluoric Acids.—The results of experiments made by Mr. O. T. Christensen, show that by the action of hydrochloric acid upon peroxide of manganese, at the ordinary temperature, manganic hexachloride and not, as has hitherto been assumed, tetrachloride, is formed. The reaction occurs according to the equation: $2MnO_2 + 8HCl = Mn_2Cl_6 + 4H_2O + 2Cl$. At very low temperatures, however, below 0°, $MnCl_4$ appears to be formed. The action of fluoric acid is analogous, but the peroxide is attacked with great difficulty.—Arch. Pharm., March 1887, 259; from Jour. f. Pract. Chem., 35, 57.

Sulphate of Manganese—Crystallization.—Mr. Edo Claassen observes that by the ordinary methods of crystallizing this salt, according to the temperature at which the crystallization takes place, salts containing different proportions of water of crystallization are obtained, and that in any event the salt separates from its concentrated solution only after very long standing. He finds that by adding some 95 per cent. alcohol to the concentrated solution, the crystallization will occur rapidly, and if allowed to take place at rest, well-formed, reddish-white prismatic crystals, belonging to the triclinic system, are obtained; if the mixtures of salt solution and alcohol are shaken, however, the sulphate of manganese is obtained in the form of a crystalline powder. In either event the salt contains 5 equivalents of water of crystallization, corresponding to the salt crystallizing without the addition of alcohol between 7° and 20°. A salt crystallizing from its aqueous solution below 6° C. contains 7 equivalents, and between 20° and 30°, 4 equivalents of water of crystallization, the latter being the officinal salt.—Pharm. Rundschau, 1887, 35.

Manganese Sulphate—Examination of Commercial Samples.—Two commercial samples, one of American, the other of German manufacture, were examined by Mr. Doane Herring. Both were found free from zinc, iron and copper, but contained magnesium, which was precipitated by ammonium phosphate from the solution of the salt previously deprived of manganese by excess of ammonium sulphide. The amount of the impurity was not estimated.—Amer. Jour. Pharm., Dec. 1886, 592.

Permanganate of Potassium—Use for the Estimation of Oxygen in the Presence of Dilute Sulphuric Acid in Peroxide of Hydrogen, which see under "Hydrogen."

Permanganate of Potassium—Action upon Hyposulphite of Sodium, which see under "Sulphur."

Permanganate of Potassium—Value as a Remedy for Frostbite.—This salt has been found very serviceable by Dr. Züboff as a local application for frostbite, a solution of 1 or 2 grains to the ounce of water being used; it relieves pain, allays inflammation, and prevents suppuration in blisters. For burns a half-grain has been employed.—Amer. Jour. Pharm., Nov. 1886, 536.

FERRUM.

Iron—Detection in Pharmaceutical Chemicals.—Mr. E. Mylius draws attention to the insufficiency of the tests usually directed for the detection of iron in certain chemicals; the directions being either for the ferrous or the ferric compound, while of the sensitive reagents none will answer for both forms. It may thus occur that a compound will contain decided quanties of iron, and this yet escape detection. As cases in point the author mentions alum and powdered boric acid. In the case of alum the iron is present as ferrous sulphate, and consequently not detected by sulphocyanide, but at once becomes evident if the ferrous compound is oxidized to the ferric. In the case of boric acid iron may be present in the metallic state, derived from the iron utensils used for its pulverization. By making a simple solution, the iron remains undissolved; if hydrochloric acid is used, the iron is dissolved, but forms the ferrous compound, which is not detected by sulphocyanide. In this instance also it is necessary to resort to oxidation. As a matter of fact the author has found powdered boric acid to be almost uniformly contaminated with decided quantities of iron. The author concludes that the detection of iron is accomplished with certainty only if acid as well as neutral solutions are employed, and if the tests are made for the ferrous as well as ferric compound, using for the latter the ferri and ferrocyanide of potassium preferably.—Arch. d. Pharm., Aug. 1886, 670; from Pharm. Centralh., 27, 305.

Ferric Ozide—Determination in Presence of Alumina.—Messrs. E. Donath and R. Jeller recommend a method for the determination of ferric oxide in presence of alumina, which is based upon the reduction, and subsequent ready solubility, of the ferric oxide by heating to redness with zinc dust. The mixture of the two bodies, obtained in the regular course of the analysis, is heated to strong redness in a covered porcelain crucible with about the same bulk of zinc dust or the finest zinc filings, under a thin layer of the latter, for 5 to 8 minutes. The cooled mass, which is easily removed from the crucible, is boiled in a flask with dilute sulphuric acid, and the iron, thus extracted along with the zinc, determined in the usual manner. The amount of iron in the zinc dust, if any, must be first determined and brought into calculation.—Arch. d. Phar., Nov. 1886, 935; Zeit. f. Analyt. Ch., xxv, 361.

Ferrous Sulphate—Preservation by the Aid of Pyrogallic Acid.—Mr. Gawaloski proposes the preservation of either crystalline or precipitated ferrous sulphate by placing in the vessel containing the salt an epouvrette half-filled with an alkaline solution of pyrogallic acid. The epouvrette is placed in such a way that the opening is sufficiently above the salt. With a good stopper, ferrous sulphate can be kept from two to three years.—Phar. Zeitschr. f. Russl., xxv, 759.

Ferrate of Potassium—Ready Method of Preparation.—Mr. C. L. Bloxam states that ferrate of potassium can be made in a short space of time by dissolving a piece of caustic potash in a small quantity of solution of chloride of iron, adding several drops of bromine and warming slightly. The resulting dark-brown mass is soluble in water, forming an intense red solution. Barium chloride yields a heavy purple-red precipitate of barium ferrate, the solution becoming colorless. A beautiful red solution of ferrate of calcium is obtained by treating chlorinated lime with ferric chloride and boiling with water; filtering through paper destroys the color. The rose-red color frequently noticed when boiling solutions of chlorinated lime is due to the formation of ferric chloride.—Chemiker Zeitung, x, p. 178.

COBALT.

Cobalt—New Series of Double Salts.—Mr. Fr. Kehrmann has prepared a new series of double salts of cobalt which are analogous with the well-known group of double salts formed by the oxalates of iron, aluminium, etc., with the oxalates of potassium and ammonium.

Cobalt and Potassium Oxalates, $K_6Co_2(C_2H_4)_6+H_2O$, is obtained when a molecule of freshly precipitated cobaltic hydroxide is mixed with somewhat more than 6 molecules of potassium monoxalate, some finely powdered oxalic acid, and sufficient water to form a thick paste, and the mixture is allowed to stand 2 or 3 weeks. A little water is added, sufficient to dissolve the separated green crystals at 30°, the deep green solution is filtered, and an equal volume of strong alcohol is added. A green mass of crystals is separated, expressed, the alcohol evaporated, dissolved in the smallest possible quantity of water at 30°, and the solution again filtered. The filtrate is evaporated at the ordinary temperature in a vacuum, and yields nearly black, magnificently developed crystals, which in their lemella exhibit distinct dichroism (dark-blue and emerald green).

The potassium may be partly replaced in this compound by sodium, by treating this salt with a cold saturated solution of chloride of sodium. It forms magnificent pyramidal tetrahedrons, and has the composition $K_3Na_3Co_2(C_2O_4)6+6H_2O$.—Arch. d. Pharm., April 1887, 354; from Ber. d. D. Chem. Ges., 1886, 3101.

Cobalt and Nickel—Atomic Weights.—According to posthumous notes of Cl. Zimmerman, who has carefully redetermined the atomic weights of nickel and cobalt, these are for Ni=58.56 and for Co=58.74. He also corrects the statements respecting the character of the monoxides of the two metals as follows:

Monoxide of Cobalt, CoO, is light brown, not magnetic, and is rapidly converted into a higher oxide, having a black color when heated on platinum foil. It forms rose-colored solutions with dilute hydrochloric or sulphuric acids, and deep blue solutions with these acids concentrated. Potassa and soda solutions dissolve it with a deep blue color, but ammonia does not dissolve it at all.

Monoxide of Nickel, NiO, has a handsome light green color, not magnetic, and dissolves in hydrochloric or nitric acid, on heating, with a green color. It is not changed by soda solutions, even when concentrated and heated.—Arch. d. Pharm., July 1886, 632, 633; from Liebig's Ann. Chem., 232, 324.

NICKEL.

Nickel—Determination on Nickel-plated Iron Ware.—Mr. A. Köbrich recommends the following method, which is particularly adapted for the determination of nickel on plated iron-ware: The vessel is placed in nitric acid of sp. gr. 1.180, diluted with an equal part of water; the solution of the nickel being effected as soon as the iron makes its appearance on all parts of the surface. The vessel is removed, rinsed, and the solution and rinsings are heated until the dissolved iron is completely converted into ferric salt, a little hydrochloric acid being added to facilitate this conversion at a moderate temperature. Muriate of ammonia and caustic ammonia are now added in excess, and the mixture heated for an hour, the nickel oxide dissolving in the ammoniacal fluid, whilst the ferric oxide is precipitated and separated by filtration. The digestion of the latter with muriate of ammonia and ammonia is repeated, and the ferric oxide is washed in the filter with dilute ammonia until a portion of the filtrate is not browned by HS ammonium sulphide. The united filtrates are treated with ammonium sulphide, acidulated with acetic acid, the sulphide of nickel dissolved in nitro-muriatic acid, precipitated as oxide with freshly prepared solution of potassa, washed, dried, and reduced to nickel in a current of hydrogen.—Arch. d. Phar., Aug. 1886, 673; from Chem. Zeitg., x, 747.

Flour—Detection of Alum.—Mr. J. Herz discusses the determination of alum in flour. For this purpose a test tube is filled ¼ to ⅓ full of the flour to be examined, a little water is added by the aid of a spritz bottle, and mixed with the flour by beating the tube upon the hand. A few cc. of alcohol and several drops of freshly prepared tincture of logwood (5 gm. logwood to 100 cc. of 96 per cent. alcohol) are added, the thick magma is well shaken, and the tube is filled with saturated solution of common salt and set aside to settle without shaking. Corresponding experiments are made with flour containing 0.01, 0.05, and 0.1 per cent. of alum respectively to enable comparison. The color-reaction becomes evident on settling, and lasts for days. In the presence of 0.05 to 0.1 per cent. alum the liquid assumes a distinct blue color, with 0.01 per cent. a violet-red. The experiment is uniformly successful if the directions are strictly adhered to.—Arch. d. Pharm., Aug. 1886, 676; from Rep. d. Anal. Chem., 86, 359.

Nickel Bromide—Preparation.—Mr. A. Damer Drew has prepared nickel bromide by treating the granulated metal with bromine under water, and carefully evaporating the dark-green solution, when deliquescent deep green needles are obtained, which dissolve freely in water, but are much less soluble in alcohol. The reaction of hydrobromic acid upon the metal, aided by heat, is very slow. Powdered nickel heated to redness absorbs bromine vapor, yielding bright yellow scales of the anhydrous salt, which are deliquescent and dissolve in water with a green color. The salt has been employed medicinally as a hypnotic and sedative, and is conveniently administered in the form of

Syrup of Nickel Bromide.—Put into a pint flask 12 oz. of water, add 377 grains of bromine and 137 grains of granulated nickel, digest at a gentle heat until reaction ceases, filter, and add sugar 24 oz. and sufficient water to make 32 fluidounces. The syrup has a beautiful green color, and contains 5 grains of crystallized nickel sulphate to the fluid drachm, which is an average dose.—Amer. Jour. Phar., Dec. 1886, 592.

Carburet of Nickel—Percentage of Carbon Taken Up.—Mr. L. Pebal has studied the character of the compound produced by the addition of graphite to melted nickel. He has found that nickel has in this respect much similarity with iron. A larger quantity of carbon is retained and a smaller quantity of graphite is separated during rapid than during the slow cooling of the melted mass. The nickel, however, retains less carbon than does iron, the maximum quantity being 1.4 per cent.—Arch. d. Phar., Aug. 1886, 715; from Liebig's Annal. Chem., 233, 160.

URANIUM.

Uranium—Atomicity, etc.—According to posthumous notes of Cl. Zimmermann, the atomic weight of uranium is 239.02, as determined by a series of careful experiments. Of the two intermediate oxides described by Peligot, U_3O_8 and U_2O_5, only the first exists; but even this is permanent only when it is heated in a current of oxygen and is allowed to cool in such. When heated in an indifferent gas, such as nitrogen or carbonic acid, it is completely reconverted into UO_2. Peligot's compound, U_2O_5, is a mixture of U_3O_8 and UO_2.—Arch. d. Phar., July 1886, 632; from Liebig's Ann. Chem., 232, 273.

Referring to the above, Mr. G. Alibegoff gives the results of his own experiments in the same direction. The lowest combination of uranium is represented by the formula UX_2, the highest UX_8; these two extremes being represented in the monosulphide of uranium (US) on the one hand and in the tetraoxide (UO_4) on the other. Compounds represented by the formula UX_4, UX_5 and UX_6 are also known to exist. The production of monosulphide of uranium, by the reduction of the sesquisulphide in a current of hydrogen, the author has established a further analogy of uranium with chromium, molybdanum and tungsten. The author, furthermore, gives the details of experiments made to accomplish the separation of uranium from alkalies and alkaline earths, which see in Liebig's Annal. Chem., 233, 117 and 143.

CHROMIUM.

Chromium—Formation and Characters of Certain Double Fluorides, which see under "Fluorine."

Chromic Acid—Insufficiency of Pharmacopœial (Germ.) *Requirement as to Quality.*—Dr. G. Vulpius draws attention to the insufficiency of the requirement of the German Pharmacopœia respecting the condition of purity of chromic acid. It is characterized as constituting scarlet-red, glistening crystals, deliquescing when exposed to the air. As a matter of fact, however, *pure*, dry, crystallized chromic acid is not scarlet-red, but dark brown-red and steel-glistening; it is, furthermore, not deliquescent except in particularly moist air. The characters attributed to the acid by the German Pharmacopœia pertain to an acid containing considerable adherent sulphuric acid. The author remarks that there is no difficulty to obtain pure chromic acid in the market—an acid that is not ordinarily deliquescent, and is practically free from sulphuric acid—and draws attention to cases that may occur in the practice of physicians in which such an acid is not alone desirable, but of absolute necessity. On the other hand, he mentions the occurrence of commercial chromic acids, offered as pharmacopœially pure, that contained as much as 7 per cent. of sulphuric acid, and acid offered for technical purposes may contain as high as 24 per cent.—Arch. d. Pharm., Nov. 1886, 964–967.

Chromate of Potassium—Reactions with Morphine, which see under "Organic Chemistry."

Chromium Heptasulphide—Non-Existence.—The heptasulphide of chromium, Cr_2S_7, which Phipson claims to have obtained by precipitation of a solution of bichromate of potassium in excess of ammonia by H_2S, according to Mr. G. Bender, does not exist. Mr. Bender has experimented under the most varied conditions; he obtained mixtures of different sulphochromates with chromic hydroxide.—Arch. d. Pharm., May 1887, 452; from Ber. d. D. Chem. Ges., 1887, 726.

ZINCUM.

Zinc—Vapor-Density.—Heretofore cadmium and mercury have been the only metals whose vapor densities have been determined, and in both cases their molecular weights were found identical with their atomic weights, which means that they have monoatomic molecules. Messrs. Victor Meyer and J. Mensching have now determined the vapor-density of zinc at a temperature of 1400°, and have in this instance also found the molecular and atomic weights the same, proving that zinc also has a monoatomic molecule.—Arch. d. Pharm., March 1887, 258; from Ber. d. D. Chem. Ges., 19, 3295.

Zinc—New Determination of Atomic Weight.—Lieut.-Colonel Reynolds and Prof. W. Ramsay have made a new determination of the equivalent of zinc by measuring the hydrogen evolved on dissolving zinc in acid, every precaution being taken to ensure accuracy. The zinc used was separated by electrolysis from sulphate of zinc, purified to the utmost possible extent. A large number of determinations were made, the final series, considered free from all known sources of error, giving a mean of $65.4787+0.016135$.—Pharm. Jour. and Trans., June 11, 1887, 1025.

Zinc Dust—Examination.—Mr. Weil recommends the following convenient method for determining the amount of zinc in commercial zinc dust. A solution of copper containing 0.01 gram of metallic copper in 1 cc. is prepared by dissolving 12.519 grams of cupric oxide, obtained by heating the nitrate, in water by the aid of a small excess of hydrochloric acid. 50 cc. of this copper solution are treated with ammonia in a platinum capsule until slight turbidity ensues. 0.4 gram of the zinc dust is added, and the mixture is stirred with a platinum wire. After ten minutes the reaction is finished, a quantity of metallic copper corresponding to the metallic zinc present being deposited. Acetic acid is added to clarify the fluid, which is brought to the volume of 200 cc. In 10 cc. of the clear liquid the amount of copper retained in solution is now determined by means of stannous chloride; this deducted from the original quantity gives the amount precipitated as metal, and from the quantity so ascertained the amount of metallic zinc in the zinc dust is readily calculated. A sample treated by the author gave 65.3% metallic zinc.—Jour. de Pharm. et de Chim., 1887, xv, 221.

Zinc Dust—Reactions.—Mr. H. Schwarz communicates two interesting reactions of zinc dust. If zinc dust is mixed with hydrate of lime, obtained by moistening lime with a little water, sifting and drying at 100° C., and then heated moderately and gradually in a combustion-tube, a regular current of perfectly pure *hydrogen* is obtained, the reaction taking place according to the following equation: $Zn+CaH_2O_2=ZnO+CaO+H_2$. If, on the other hand, the zinc dust is mixed with a molecule of chalk, *carbonic oxide* is obtained under the same conditions. The carbonic oxide is nearly chemically pure. The zinc is readily recovered from the residue by reduction.—Arch. d. Pharm., July 1886, 630; from Ber. d. D. Chem. Ges., xiv, 1140.

Ammonio-Chloride of Zinc—Formation.—Mr. H. Thoms has observed the formation of ammonio-chloride of zinc, having the composition $ZnCl_2(NH_3)_2$, in a Leclanché element, which is composed of carbon and zinc, and is placed in concentrated chloride of ammonium solution along with small pieces of black oxide of manganese. The formation under these conditions is explained very readily; the zinc becomes oxidized, the oxide is taken up by the chloride of ammonium solution, and the compound then crystallizes out upon the slow evaporation of the liquid. The compound may readily be obtained by dissolving freshly precipitated hydrated oxide of zinc in concentrated solution of muriate of ammonium, and evaporating the solution to a certain degree of concentration.—Arch. d. Pharm., May 1887, 452; from Ber. d. D. Chem. Ges., 1887, 743.

CUPRUM.

Cuprous Chloride—Preparation.—Mr. Cavazzi prepares cuprous chloride by dissolving four grams of cupric sulphate and two grams of hypophosphite of sodium in 50 cc. of water, adding thirty drops of fuming hydrochloric acid and heating to 60° or 70° C., when cuprous chloride is precipitated. The precipitate is first washed with acidulated water (eight drops HCl to 100 cc.), then with absolute alcohol, and is dried in vacuo over sulphuric acid. By this process the hypophosphorous acid is oxidized to phosphoric acid.—Pharmac. Zeitsch. f. Russland, xxv, p. 567.

Cupric Oxides—Two Distinct Kinds.—It is well known that cupric oxide differs in its solubility according to its method of preparation, that obtained by precipitation being more readily soluble than that obtained by heating the sulphate or nitrate to redness. Experiments now made by Joannis seem to indicate that this difference is not due, as is generally assumed, to physical causes, but that the two oxides differ specifically from each other.—Arch. d. Pharm., Nov. 1886, 983; from Jour. de Pharm. et de Chim., 1886, xiv, 286.

Sulphate of Copper—Compound With Methyl Alcohol, which see under "Organic Chemistry."

STANNUM.

Stannic Oxide—Compound with Sulphuric Acid.—Mr. Ditte has obtained the compound $SnO_2,2H_2SO_4$ by dissolving gelatinous, or also powdery, stannic acid in moderately-diluted sulphuric acid, and evaporating the solution to a small volume. The compound is obtained in prisms or in tables, which deliquesce in air, are not decomposed by ether, but are decomposed by much water or by alcohol with separation of stannic oxide.—Arch. d. Phar., April 1887, 362; from Jour. de Pharm. et de Chim., 1887, xv, 287.

Chloro-Stannic Acid—Preparation and Characters.—By passing a current of dry hydrochloric acid over crystals of pentahydrate of chloride of tin ($SnCl_45H_2O$), Engel found the crystals to disappear gradually, and that a liquid resulted, which congeals at 0°, forming a crystalline mass. The mother liquor may be removed from these crystals by the centrifugal apparatus, when the handsome colorless residual crystals will constitute a new compound, of the composition $SnCl_4.2HCl.6H_2O$, which the author has named chlorostannic acid. The crystals melt at 20°, and form a liquid having the s. g. 1.925 at 28°.—Arch. d. Pharm., Dec. 1886, 1035; from Jour. de Phar. et de Chim., 1886, xiv, 349.

Chlorostannic Acid—Preparation.—According to Mr. K. Seubert, chlorostannic acid is readily obtained if to a weighed quantity of chloride of tin an amount of strong, pure hydrochloric acid, corresponding to the amount of water in the compound $SnCl_4:6H_2O$, is added in a flask, and a current of dry gaseous HCl is passed into the mixture as long as it is absorbed. On cooling the flask the entire contents congeal to form a lamellated mass of colorless crystals. Chlorostannic acid has the composition $H_2SnCl_6 + 6H_2O$. *Bromo-stannic Acid* was obtained by the author in a similar manner. It constitutes amber yellow needle-shaped crystals, having the composition $H_2SnBr_6 + 9H_2O$.—Arch. d. Phar., May 1887, 452; from Ber. d. D. Chem. Ges., 1887, 793 and 794.

TITANIUM, ETC.

Titanium—Sulphur Compounds.—Mr. O. von der Pfordten finds that by the action of sulphuretted hydrogen, at a low temperature, the tetrachoride of titanium is reduced to dichloride. If the action takes place at a higher temperature, another compound is formed, in all probability a sulphochloride; at a red heat, on the other hand, pure crystallized sulphide of titanium, TiS^2, is produced. *Sulphide of Titanium* is a splendid, metallic-glistening, yellow substance, absolutely permanent in air at the ordinary temperature, but oxidized when heated to redness. When heated in a current of an indifferent gas, for instance nitrogen, it is decomposed; sulphur separates, and

Sesquisulphide of Titanium, Ti_2S_3, is formed. This is a metallic, grey-black substance, and is fully as permanent in air, etc., as the compound TiS_2. The

Monosulphide of Titanium, TiS, may be obtained by reduction with hydrogen from either of the above sulphides at a very high temperature. It is a metallic, dark brown-red substance, and quite as resistent towards the action of air, water, and dilute sulphuric acid as the two above-described sulphides.—Liebig's Annalen, 234, 257.

Titänic, Niobic, Tantalic, and Stannic Acids—Method of Recognition. Mr. Levy recommends that the substance supposed to contain a mixture of the above acids be heated to redness with carbonate of ammonia, in order to expel the last traces of nitric acid that may have been used in their previous treatment. Several milligrams of *morphine* are then moistened with a few drops of concentrated sulphuric acid, and a grain of the substance is mixed with the solution. The production of a carmine-red color is indicative of the presence of *titanic acid.* In a second experiment *codeine* is substituted for morphine. A malva-color indicates *niobic acid.* In a third experiment *resorcin* is substituted for the alkaloids. A violet-amethyst color is produced in presence of *tantalic acid*, but if considerable quantitics of the other two acids are present, a green instead of a violet color will result. If *a-naphthol* is substituted for resorcin, the production of an amethyst color determines the presence of *stannic acid.*—Arch. d. Pharm., April 1887, 362; from Jour. de Pharm. et de Chim., 1887, xv, 70.

VANADIUM.

Sulpho-Vanadate of Ammonium—Reaction with Colchicine.—Messrs. Schützenberger and Vulpian, as experts in a recent poisoning case, have experimented to determine whether the characteristic reaction of sulpho-vanadate of ammonium upon colchicine was also obtainable by other alkaloids or proximate principles. The test was originally proposed by Manfarmé from the laboratory of Prof. Dragendorff, and depends upon the observation that with 1 part of the sulpho-vanadate dissolved in 200 parts of monohydrated sulphuric acid, pure colchicine gives a fairly intense green color, changing rapidly to a violet brown. The test was applied to veratrine, digitalin, pilocarpine, morphine, narceine, codeine, eserine, cocaine, caffeine, berberine, gelsemine, narcotine, kairine, brucine, strychnine, solanine, colchiceine, curarine, arbutin, sabadilline, aloin, rhein, esculin, santalin, and igasurine. Of these the only ones which resemble at all the effect on colchicine are colchiceine, a derivative of colchicine, which, as far as the authors could test it, resembled colchicine exactly in its reactions, a fact of scarcely any importance for their purposes; arbutin, greenish at first turning to dirty brown; aloin, green turning to brown; rhein, persistent green. These three substances are, however, distinguishable from colchicine in not giving a violet tint with nitric acid 1.40, as the latter does.—Chem. and Drugg., July 10, 1886, 54.

BISMUTHUM.

Bismuthates—Indefinite Composition.—Messrs. M. Pattison Muir and Douglas J. Carnegie have attempted to isolate definite compounds of Bi_2O_5 or Bi_2O_4, with K_2O, but without success. They find that very long continued washing is required to remove all the potash from the solid products of the reaction between BiO_3H_3 or BiOCl, very concentrated potash solutions and chlorine. They show that $Bi_2O_5xH_2O$ dissolves in about one hundred times its weight of boiling solution of KOH in a little water, and that yellowish-white solids are obtained by nearly neutralizing this solution; that these solids may be washed free from potash by boiling water, and that the residual bodies contain more oxygen than Bi_2O_3, and nearly approach the composition Bi_2O_4. They conclude that Bi_2O_5,xH_2O exhibits fully acidic functions in its reaction with a large mass of very concentrated potash solution; that under these conditions compounds of the form xBi_2O_5,yK_2O are probably formed, but that such compounds can only exist, if at all, in presence of large quantities of potash. The authors give reasons for regarding the formulæ given by C. Hoffmann to so-called potassium bismuthates as of little if any value.—Pharm. Jour. and Trans., Dec. 11, 1886, 479.

Bismuth Oxyiodide—Preparation and Uses.—Dr. A. Sidney Reynolds regards this compound as being very valuable in the treatment of chronic ulceration; he states that the salts will control inflammation, allay irritation, suppress suppuration, promote granulation and induce cicatrization. He has employed it internally in doses of 5 to 10 grains. When a solution of bismuth subnitrate in nitric or in hydrochloric acid is diluted with water as far as possible, and is then added gradually and with continual stirring to a solution of potassium iodide, a brown precipitate is produced, which on dilution with water turns yellowish-red, and on drying yields a bright, brick-red powder, consisting in the main of BiOI, but mixed with variable proportions of subnitrate or oxychloride. To obtain the oxyiodide pure, the brown bismuth iodide may be dissolved in hydriodic acid or in potassium iodide and diluting the solution with water. On subliming a mixture of iodine and powdered bismuth, blackish scales of bismuth iodide having a metallic lustre are obtained. This compound is permanent in the air, and is but little affected by cold water, but hot water converts it into the red oxyiodide.—Med. News, Oct. 9, 1886.

Mr. Caswell Mayo draws attention to the above compound, under the name of

Bismuth Subiodide, and gives a method for its preparation which corresponds in every particular with that given by Dr. Reynolds. He expresses the opinion that the formula should be $BiOIH_2O$, though his experiments have not established this conclusively.—Amer. Jour. Pharm., Dec. 1886, 590 and 599.

Subiodide of Bismuth—Preparation.—Mr. Joseph W. England records experiments made to determine a reliable working formula for subiodide of bismuth, so that this compound may become cheaper and more generally available. There appear to be two methods in use, the one by "trituration," the other by "precipitation," of which the last named is the most reliable, but at the same time more expensive. The author has devised a satisfactory modification of the "precipitation" method, which, together with his "trituration" method, is given below.

Method by Trituration:

Take of

Bismuth subnitrate	℥iiss, gr. xxiv.
Water (hot)	f℥viij.
Potassium iodide	ʒxj. gr. iij.
Dilute nitric acid	q. s., or about f. ʒvj.

Triturate, in a mortar, the bismuth compound, with the potassium iodide dissolved in the hot water, and then slowly add, with constant trituration, fʒiv. of the dilute acid, and the remainder, drop by drop, until the decomposition is complete. Filter; wash the precipitate thoroughly with warm water until the washings cease to affect blue litmus-paper; dry, and powder. The yield is about three troy ounces.

Method of Precipitation.—

Take of

Bismuth subnitrate	℥iiss, gr. xxiv.
Acid nitric	f℥iii.
Hot water	f℥xii.
Potassium iodide	ʒxi, gr. iii.
Hot water	f℥xxviii.

Dissolve the bismuth salt in the acid in a porcelain capsule with the aid of heat, and add 12 fluidounces of boiling water in small portions at at time, stirring after each addition. Then pour the bismuth solution in the hot water, in which has been dissolved the iodide, agitating it well after each addition. Continue agitating until decomposition is complete. Filter at once. Wash the precipitate with warm water, dry and powder. The yield is about the same as by the trituration method.—Amer. Jour. Phar., Jan. 1887, 9–15.

Bismuth Oxyiodide—Preparation.—Mr. Frank X. Moerk considers the use of strong acids in connection with the above processes an objection. To avoid their use he has made some experiments, and finds that by simply boiling oxynitrates of bismuth ($BiONO_3$) and iodide of potassium together, a very satisfactory product is obtainable, as follows:

Bismuth subnitrate	10 gm.
Potassium iodide	4 gm.
Water	50 cc.

Boil for 30 minutes, filter and wash the precipitate until the washings no longer produce turbidity with solution of silver nitrate. Dry, first by pressing between bibulous paper, and then at 120° C.

The advantages of this product are: First, the avoidance of free acid; Second, its definite composition; Third, a higher percentage of BiOI than is obtained by either of the published processes.

The pure salt, BiOI, cannot thus be obtained, however, the product containing 44.59 per cent. $BiONO_3$ and 55.41 per cent. BiOI. He, however, succeeded in obtaining pure BiOI by the action of hydriodic acid on bismuth subcarbonate, as well as by several other methods. It is an open question whether the latter is the desired product, and whether in point of fact the physiological properties of the two compounds are identical.—Amer. Jour. Pharm, March 1887, 117–122.

Mr. Moerk, having observed that bismuth oxyiodide is supplied by a large manufacturing firm in the condition of an impalpable powder, bulky, and of a light brick-red color, and finding that the preparation obtained by his above process is crystalline in structure, of darker color, and with difficulty reduced to an impalpable condition, he has made a number of experiments, which finally led to the following formula and process that yielded a satisfactory preparation:

Iodine	4.6 gm.
Bismuth subnitrate	10 gm.
Nitric acid, 1.42	10 cc.
Solution of soda, U. S. P	150 cc.
Water, a sufficient quantity.	

The iodine is covered with 50 cc. of water, and converted into hydriodic acid by passing H_2S through the mixture, boiling to remove excess of H_2S, and filtering.

The subnitrate is dissolved in the nitric acid, diluted with 10 cc. water, and then enough water added to produce a slight permanent opalescence; this mixture is then slowly poured into the solution of soda, taking the precaution to stir constantly. The precipitate is washed by decantation until the washings cease to blue red litmus paper; 50 cc. water added to it, and the hydriodic acid gradually poured in until after stirring and allowing to settle, the supernatant liquid has a yellow color. The oxyiodide is washed by decantation, removed to a filter, allowed to drain, and, finally, dried at a temperature not exceeding 100° C. The oxyiodide so gotten has a light yellowish-red color, and contains no water of crystallization, as was found by analyzing some made without the application of heat.—Amer. Jour. Pharm., June 1887, 273–274.

Bismuth Oxyiodide—Preparation.—Mr. G. Greuel reviews the literature upon the subject of bismuth oxyiodide, which is quite meagre, the characters of the compound and the methods that have been recommended for its preparation, among these particularly the methods of Mayo and of England. He has prepared the compound by treating subnitrate of bismuth with iodide of potassium, the reaction being completed in the cold in the course of 2 to 3 hours, at the boiling temperature in the course of 10 to 15 minutes. The resultant preparation is remarkably dark in color and contains much subnitrate. Of the methods considered the author gives preference to that of England (see above). The author gives a method for the chemical and microscopic examination of the compound, and defines the characters of a properly constituted preparation.—Arch. d. Pharm., May 1887, 437–442.

Bismuth Subnitrate—Examination of Commercial Samples.—Four commercial samples of this salt were examined by Mr. Samuel L. Rambo. On drying the salt at 120° C. the loss in weight from the evaporation of moisture varied between 2.0 and 3.42 per cent., and the oxide resulting from ignition weighed 79.2, 79.8, 80.2, and 80.25 per cent. Using Fleitmann's test two samples were found to be free from arsenic, the other two containing slight traces of that metal. By boiling with acetic acid, treating the filtrates with hydrogen sulphide, and evaporating the filtered liquids, a minute quantity of residue was left in each case. In one of the samples a trace of the sulphate was observed, and the presence of traces of carbonate and chloride was indicated in each sample. The four samples are regarded to be of medicinal purity.—Amer. Jour. Pharm., Dec. 1886, 592–593.

Subnitrate of Bismuth—Advantages as a Dressing.—The advantages of subnitrate of bismuth as a dressing are summed up in "Annals of Surgery" as follows:—(1) Subnitrate of bismuth possesses antiseptic properties at least equal to those of iodoform. (2) No poisonous effects are to be apprehended, as in the employment of iodoform. (3) The subnitrate of bismuth, being a chemically indifferent substance, does not irritate the wounds; secretion is diminished. (4) Its action is very prolonged, although not vigorous, so that the dressings do not need to be frequently changed, and rest is insured for the wounds. (5) There is no action at a distance, nor does any specific effect attach to it. (6) It does not afford protection against erysipelas and other wound diseases, at least no more than iodoform. (7) It is no disinfectant, but as an antiseptic it keeps the wounds pure. (8) All wounds capable of healing by first intention can do so when dressed with bismuth. (9) It also represents an excellent material for forming scabs under which epidermis can grow over the wound. Its use on granulating wounds has not, however, been sufficiently studied as yet.

ARSENICUM.

Arsenic—Electrolytic Formation of Arsenuretted Hydrogen with a View to its Determination.—Among the many methods employed for the determination of arsenic, that of separating the arsenic as arsenuretted hydrogen by electrolysis has been already mentioned by Dragendorff as exceedingly sensitive. C. H. Wolf now contributes the results of his comprehensive studies and experiments with this method, and has found that it exceeds all others in accuracy and sensitiveness. The author's paper is quite lengthy, and is accompanied by an illustration and description of the apparatus necessary, for which reference may be had to his original paper in Pharm. Centralh., 1886, xxvii, 608.

Arsenic.—Removal from *Hydrochloric Acid*, which see under "Chlorine."

Arsenic.—Presence in *Commercial Chloroform*, which see under "Organic Chemistry."

Arsenic.—A Contaminant of Commercial *Liquor Ferri Chloridi*, which see under "Pharmacy."

Arsenic.—Occurrence as a Contaminant in *Chloroform*, which see under "Organic Chemistry."

Arsenious Acid.—Compound with *Sulphuric Anhydride*, which see under "Sulphur."

Arsenious Bromide—Preparation and Character.—Mr. James Kennedy observes that the arsenic is not present in "Clement's Solution of Bromide of Arsenic" as arsenious bromide but as arsenic bromide. A solution of arsenious bromide seems desirable. Such is, however, only possible in alcoholic solution, or in glycerin, chloroform or ether solution. Addition of water to the alcoholic solution occasions decomposition, arsenious acid being produced, and, unless in very dilute solutions, precipitated. The author has succeeded in obtaining arsenious bromide, after trying different methods, by distilling a mixture of sodium bromide, arsenious oxide, and sulphuric acid. The reaction is expressed in the following equation: $6NaBr + As_2O_3 + H_2SO_4 = 2AsBr_3 + 3Na_2SO_4 + 3H_2O$, the water coming over in first portion of distillate; the receiver is then changed, when the $AsBr_3$ will be obtained in crystalline mass. Molecular proportions of the substances should be employed to prevent formation of hydrobromic acid.—Nat. Drugg., July 30, 1886, 58.

Sulphides of Arsenic and Antimony—Use for Bronzing Metals, which see under "Pharmacy" (Miscellaneous Subjects).

Iodo-Sulphide of Arsenic—Formation and Characters.—Mr. R. Schneider has studied the action of iodine upon realgar. If an intimate mixture of 2 mol. of iodine and 1 mol. of realgar are heated with exclusion of the air, the mixture melts without liberation of iodine, forming a dark ruby-red fluid, which congeals to form a glassy, amorphous mass. Artificial sulphide of arsenic may be substituted for realgar with the same result. The new compound has the composition corresponding to the simple formula AsIS, but its constitution is probably a complicated one—probably AsI_3,As_2S_3—since the same compound is obtainable by melting together As_3I and As_2S_3 in molecular proportions. It begins to soften at 100°, then becomes thin fluid, and boils at a higher temperature, distilling under partial decomposition. The author describes the action of acids and alkalies upon the new compound.—Arch. d. Pharm., Feb. 1887, 183; from Jour. pract. Chem., 34, 505.

Kakodylic Acid—Physiological Action.—In order to determine the doubtful question as to whether the kakodylic compounds possess the poisonous property common to all other arsenical compounds, Marshall and Green instituted a series of experiments on cats and rabbits with kakodylic acid. This acid when first used produced considerable disturbance, and one death, but it was afterward discovered that the specimen was contaminated with arsenious oxide. The experiments were then repeated with an acid found to be perfectly pure. This introduced into the stomach in doses of ½ gram, repeated several times, produced vomiting and diarrhœa, and evident inflammation of the alimentary tract. The garlicky odor was evident in the breath, and kakodylic acid was in every case found in the urine. In one case it produced death. The authors' experiments, therefore, show that kakodylic acid produces symptoms analogous to those of arsenious oxide, though the results are not necessarily fatal. They conclude, however, that kakodylic acid is not a poison in the general acceptation of the word.—Drugg. Circ., Aug. 1886, 172; from Amer. Chem. Journ.

ANTIMONIUM.

Antimony—Determination of Vapor Density.—While antimony is volatilized copiously at 1300°, the volatilization is not sufficiently rapid to permit the determination of its vapor density. Mr. V. Meyer has now constructed a furnace which will enable this determination at 1600°.—Arch. d. Pharm., May 1887, 450; from Ber. d. D. Chem. Ges., 1887, 497.

Antimonuretted Hydrogen—Solidification.—This gas has hitherto not been liquefied. Mr. K. Olszewski has succeeded to solidify it by cooling the tube through which it was passed by means of aethylene. The gas is thus reduced to the condition of a snow-white mass, which, on raising the temperature by means of ether, melts at —91.5°, forming a colorless fluid.—Arch. d. Pharm., Nov. 1886, 981; from Monatsh. f. Chem., 7, 371.

Sulphide of Antimony—Action of Sulphide of Potassium.—Mr. Ditte finds that the two compounds act upon each other differently under varying conditions. A concentrated solution of sulphide of potassium dissolves copious quantities of sulphide of antimony, and yields on evaporation, when the former compound is in excess, light yellow octahedral crystals having the composition $2K_2S,Sb_2S_3$. If a more dilute solution of sulphide of potassium is employed, red prismatic crystals, having the composition $2Sb_2S_3,K_2S,3H_2O$, are obtained, which change on exposure to light. If a melted mixture of sulphide of antimony, carbonate of potassium and sulphur is allowed to cool slowly, and then treated with cold water, red transparent crystals remain undissolved, having the composition K_2S,Sb_2S_3. If some solution of sulphide of potassium is added to golden sulphurate of antimony suspended in water, the latter changes in color gradually, and after a short time the entire liquid becomes a liver-brown gelatinous mass, which is soluble in an excess of sulphide of potassium, forming a light yellow solution. From a concentrated solution of sulphide of potassium saturated with sulphur, sulphur is precipitated in yellow flocks upon addition of antimonic sulphhydrate.—Arch. d. Pharm , 1886, 551; from Jour. Pharm. Chim., 1886, 279.

HYDRARGYRUM.

Mercury—Occurrence in Zincblende.—Mr. P. Soltsien, referring to the observation made by Mr. Bellingrodt at the recent meeting of the German Apothecaries' Association, that Rhenish zincblende contained a small percentage of mercury, draws attention to a similar observation made by him with respect to Spanish zincblende, which indeed, contains a larger percentage = 0.135 per cent. Hg, whilst the Rhenish appears to contain only 0.02 per cent.—Arch. d. Pharm., Sep. 1886, 800.

Mercury—Purification.—It is generally assumed that mercury cannot be purified completely by simple distillation. Mr. V. Meyer prepared amalgams with different metals, distilled them at first out of porcelain, then out of glass retorts, and found that after 12 distillations the mercury was absolutely pure.—Arch. d. Pharm., May 1887, 449; from Ber. d. D. Chem. Ges., 1887, 497.

Mercury—Determination in Presence of Organic Substances.—In the course of the examination of some suspected food, Mr. M. T. Lecco observed on the surface of a distillate a dark-colored substance, which on examination proved to be metallic mercury. He draws attention to the importance of this observation, inasmuch as mercuric chloride cannot be detected as such by the usual methods after the food has been exposed for some time (in the instances mentioned, after six weeks) and is reduced at once on subjecting the food containing it to distillation, metallic mercury passing into the distillate as above stated.—Arch. d. Phar., July 1886, 630–631; from Ber. d. D. Chem. Ges., xix, 1175.

Yellow Mercuric Oxide—Examination of Commercial Specimens.—

Mr. L. W. Hawkins draws attention to the fact that commercial yellow mercuric oxide invariably contains a trace, or more, of fixed matter, and that, though in other respects very satisfactory, they do not strictly correspond to the requirements of the Br. Pharm., since they do not volatilize entirely, nor are completely soluble in hydrochloric acid. The results of his examination of seven samples are given as follows:

	HgO.	Hg_2O.	Fixed Matter.
1.	98.238	.454	.272
2.	96 489	.895	1.007
3.	98.174	.532	.371
4.	98.237	.746	.416
5.	97.692	.268	.212
6.	96.895	.853	.954
7.	97.787	.758	1.015

The deficits, he presumes, may be attributed to moisture which was not separately estimated, except in one or two cases, as a check.—Pharm. Jour. and Trans., Feb. 5, 1887, 640.

Calomel.—Action of *Pepsin*, which see under "Organic Chemistry."

Calomel—Incompatibility with Iodoform.—Mr. S. J. Bendiner has made the observation some time ago that a mixture of iodoform and calomel undergoes chemical change. Mr. August Drescher has now made a similar observation, and has experimented to determine the cause, arriving at the following conclusions:

1. That the decomposition of the mixture of iodoform and calomel is a case of simple metathesis induced by light (actinism) or heat.

2. That the formation of the red substance (mercuric iodide) is not due to the primary reaction of the two substances under consideration, (iodoform and calomel) upon each other, but that it is the product of a secondary reaction, (as evinced by experiment *b*) which cannot lay claim to our attention in this case, as it is proper to the caprices of the mercurous iodide alone. On heating mercurous iodide alone in a tube, or on exposing it to actinic rays, the results, as far as the formation of red iodide—and, according to circumstances, metallic mercury, in globules, or finely divided, or partially oxidized (?)—will be exactly similar to those obtained in our present secondary reaction.—Drugg. Circular, April 1887, 75.

Corrosive Sublimate—Non-Effect of Muriate of Ammonium in its Solutions on its Antiseptic Qualities.—Mr. E. Mylius observes that whilst muriate of ammonium is frequently employed to increase and facilitate the solution of corrosive sublimate in water, it is not so generally known that the addition of this salt *does not* affect the antiseptic action of the mercuric salt. It is therefore quite practicable to prepare concentrated watery solutions which may be diluted for antiseptic purposes as may be required.—Arch. d. Pharm., Dec. 1886, 1025; from Pharm. Centralh., 1886, xxvii, 515 et seq.

Mercuric Chloride.—Incompatibility with *Sulphate of Quinine*, which see under "Organic Chemistry."

Corrosive Sublimate.—Determination in *Sublimate Soap*, which see under "Pharmacy."

Corrosive Sublimate—Incompatibility with Well Water.—Mr. E. Stütz, at the instance of Prof. Fürbringer, who had found solution of corrosive sublimate that had been prepared with ordinary water devoid of that compound, has made experiments to determine the cause. He found that in solution of corrosive sublimate in water containing bicarbonates of the alkaline earths, a precipitation of tetra-oxychloride of mercury results in a manner perfectly analogous to the active carbonated alkalies. In the case of a solution of 1 gram corrosive sublimate in 1 liter of hard (18°) well water, 80 per cent. of the salt was thus precipitated out, whilst if only 0.8 gram is used, the whole of the corrosive sublimate is precipitated. It follows that solutions of corrosive sublimate are best made with distilled water; but if for economic reasons it becomes desirable to employ hard well water, the carbonate of the alkaline earth should be first decomposed by the addition of some acid that does not change the character of the corrosive sublimate. Calculating, for instance, the amount of CaO present in a liter of hard well water, one of the following acids may be added in the quantities noted:

Sulphuric acid	96 per cent.,	0.368 gm.
Hydrochloric acid	25 "	1.043 "
Nitric acid	30 "	1.500 "
Salicylic acid		0.986 "
Acetic acid	96 "	0.446 "
Vinegar	6 "	7.145 "

—Arch. d. Phar., Oct. 1886, 857–858; from Phar. Centralh.

Ammonio-Mercuric Chloride—Uses, etc.—This salt, the *Sal Alembroth* of the older writers, is now largely used by Sir Joseph Lister for dressings, the solution used for rendering bandages, lint, etc., aseptic being prepared of 1 part of the double salt to 100 parts of water, colored by a little aniline blue, 1 in 10,000, the latter becoming reddish on coming in contact with an alkaline discharge. From the accounts published in medical journals the pure double salt seems to be used, prepared by sublimation. This has the composition $NH_4Cl.HgCl_2$, and may be obtained by subliming a mixture in molecular weights of ammonium chloride, 53.4, and mercuric chloride, 270.5. Davy found that the sublimate usually contains a little calomel and hydrochloric acid from partial decomposition. When the mixture of the two salts is crystallized from water, the double salt is obtained either anhydrous in rhombohedrons, or in long silky needles containing 1H_2O. Lister's solution, however, can be readily made from the salts by dissolving 21 grains of ammonium chloride and 100 grains of mercuric chloride in 12,100 grains (27⅝ oz. av., or 26⅝ fluidounces, U. S. measure), and adding 1¼ grains aniline blue.—Amer. Jour. Phar., Nov. 1886, 534–535.

Mayer's Reagent—Action on Different Alkaloids, which see under "Organic Chemistry."

Mercuric Nitrate—Error in the Officinal Solution, which see under "Pharmacy."

Fulminate of Mercury—Convenient Method of Preparation.—Mr. Ernst Beckmann gives the following convenient method for the preparation of fulminate of mercury: 50 grams of mercury are dissolved in 600 grams of nitric acid, s. g. 1.4, the solution is put into a globular flask, with a wide mouth and of 5 liters capacity, heated to 25°–30°, and 550 grams of alcohol of 98.5 per cent., heated to the same temperature, are added at first about one-half; then, when the mixture begins to assume a red-brown color, more is added, whereby the reaction is reduced, and so on until all the alcohol has been added. If there is danger of frothing over, the flask must be cooled by cold water. White vapors are developed during the reaction. As soon as these give place to red-brown and more transparent vapors, the reaction is intercepted by the addition of 1 liter, or more, of cold water. The fulminate of mercury is then washed with water into a beaker. With some experience one kilogram of fulminate of mercury can thus be made in the course of half a day.—Arch. d. Pharm., July 1886, 629; from Ber. d. D. Chem. Ges., xix, 993.

Referring to Mr. Beckmann's method of preparing fulminate of mercury, Mr. C. A. Lobrey de Bruyn observes that the method can be employed without the least danger if the mercuric nitrate solution is added in small portions to the entire amount of alcohol, with agitation after each addition. The danger in the directions of Mr. Beckmann consists in the violent reaction produced when alcohol is added to the mercuric solution, a portion of the material being liable to be expelled from the flask by too violent reaction.—Arch. d. Pharm., Aug. 1886, 715; from Ber. d. D. Chem. Ges., xix, 1370.

ARGENTUM.

Argentous Oxide—Question of Existence.—Messrs. G. H. Bailey and G. J. Fowler, at a meeting of the Chemical Society of Great Britain, communicated some experiments made to establish the existence of argentous oxide. Repeating the experiments of Wöhler, they find no evidence of the formation of an argentous citrite when argentic citrate is heated to 100° in a current of hydrogen. The oxide precipitated from the aqueous extract contains metallic silver. Faraday's suboxide of silver is a modified form of ordinary oxide of silver.

At the same meeting Dr. Armstrong pointed out that Von der Pfordten has recently adduced evidence in favor of the conclusion that an argentous oxide can be obtained.—Phar. Jour. and Trans., April 23, 1887, 877.

Argentic Nitrate—Manufacture.—Mr. Frederick Wright communicates some interesting observations respecting the preparation of nitrate of silver on an extensive scale, which may be consulted in the author's paper, reprinted from "Austral. Jour. Pharm." in Drugg. Circ., Jan. 1887, 3.

Ammonio-Nitrate of Silver—Characters and Composition.—Mr. Harry Napier Draper observes that it is not a little remarkable that the phenomena attendant upon so familiar a process as the preparation of a solution of ammonio-nitrate of silver should remain absolutely unnoticed in the text-books, and that only one chemist (Prescott, in Jour. Am. Chem. Soc.), as far as he has been able to find, has ventured upon an opinion as to the nature of the precipitate formed on the addition of ammonia to nitrate of silver; the hypothetical formula $(NH_3Ag)_2O$ being given. Mr. Draper now communicates the results of numerous experiments, which give some very positive information on these points, and concludes as follows:

When ammonia is added to a solution of *neutral* nitrate of silver, the first addition produces a precipitate of oxide of silver. When the quantity of ammonia added is just enough to form nitrate of ammonium the reaction

$$2AgNO_4 + 2NH_4OH = 2NH_4NO_3 + Ag_2O + H_2O$$

takes place, but by far the greater part of the oxide of silver dissolves in the nitrate of ammonium formed, and it is only on the further addition of ammonia that ammonio-nitrate of silver is produced.

$$AgNO_3 + 2NH_4OH = AgNO_3,2NH_3 + H_2O,$$

a result which may also be obtained by the solution of oxide of silver in a mixture of nitrate of ammonium with ammonia,

$$Ag_2O + 2NH_4.NO_3 + 2NH_4OH = 2AgNO_3,2NH_3 + 3H_2O.$$

This body (described by Mitscherlich in "Gmelin," vol. vi. p. 177) may be obtained by the slow evaporation of its solution. It forms rhombic crystals permanent in the air, and easily soluble in water. The solution reacts strongly alkaline towards both phenolphthalein and turmeric. When the crystals are heated—as may be done with perfect safety—they fuse, and leave a residue of metallic silver. It is this compound which is contained in the ammonio-nitrate of silver solution of the Pharmacopœia and of the laboratories, and the author points out that it is a very different substance from that obtained by dissolving oxide of silver in ammonia, or by adding potassium or sodium hydrate to any solution of silver containing ammonia. The former, as has been stated, may be heated, even to redness, with impunity, while the solution of oxide of silver in ammonia, on losing by exposure to air two molecules of ammonia, splits up with treacherous facility into water and Berthelot's fulminating silver.—Pharm. Jour. and Trans., Dec. 18, 1886, 487–488.

AURUM.

Gold—Atomic Weight.—The numbers obtained in former determinations of the atomic weight of gold differ widely from each other, that usually accepted being 196.2, the value obtained by Berzelius in his second series of determinations, from an analysis of the double chloride of gold and potassium. Messrs. T. E. Thorpe and A. P. Laurie, finding that a revision of the atomic weight of gold arises from the circumstance that a higher value than that usually assigned to this element is demanded by the periodic law, have now made a series of determinations, and obtained 196.850 as the figure representing the mean of twenty-five experiments. The authors employed for this purpose the bromide of gold and potassium, which crystallizes readily from water, and was proved to be stable at ordinary temperature. The salt was prepared by digesting together gold, water, bromine and bromide of potassium, and was then three times crystallized.—Phar. Jour. and Trans., April 30, 1887, 894.

Gold—Atomic Weight.—Mr. G. Krüss has made thirty determinations of the atomic weight of gold by five different methods, which agreed well among themselves, and give 196.64 as the atomic weight. He has also prepared and describes

Chloride of Gold by sublimation as follows: Powdered gold is exposed to the action of a current of dry chlorine at elevated temperature. At 150° small quantities of red-brown vapor are given off, and condense in the tube in form of a yellow-red coating; when the temperature is reduced to 140°, the sublimation is intercepted and the entire mass becomes converted almost entirely into auro-auric chloride. If the heat is now increased to 180–190°, this compound decomposes, notwithstanding that the current of chlorine is continued, into green aurous chloride and small quantities of volatile auric chloride, chlorine being eliminated by the compound. At still higher temperatures a little more volatile auric chloride passes over, and metallic gold remains in the subliming vessel. The volatile auric chloride forms shining, red-brown needles. It is formed only in very small quantities and is perfectly pure $AuCl_3$, without a trace of any other gold chloride. $AuCl_3$ is the highest compound of chlorine with gold, just as Au_2O_3 is the highest oxide.—Arch. d. Pharm., April 1887, 355; from Ber. d. D. Chem. Ges., 1887, 205 and 211.

Gold—New and Characteristic Reaction.—Dr. Hager gives the following new reaction for gold. To several drops of a dilute solution of chloride of gold is added several drops of a solution of arsenic acid, 2 or 3 drops of solution of ferric chloride and 2 or 3 drops of hydrochloric acid, the whole diluted with 100 cc. of water. When a piece of zinc is thrown into the mixture the liquid immediately around the zinc assumes a purple color, and when agitated the color is distributed to all the liquid, and remains for half an hour. This reaction is very delicate even in solution of 1:1,000,000. The color disappears at once when the mixture is shaken with zinc dust. If no hydrochloric acid is added a purple precipitate consisting of double arseniate of iron and gold is produced. If phosphoric acid is used in place of arsenic acid, a violet or blue coloration results.—Phar. Centralhalle, xxvii, p. 321.

Gold—Character of Oxides.—The following oxides of gold are mentioned in "Gmelin-Kraut's Chemistry," viz.: Au_2O, Au_2O_2, Au_2O_3, Au_2O_4, Au_2O_5, and a so-called purple oxide, intermediate between Au_2O_2 and Au_2O_3, of undetermined composition. Mr. Gerh. Krüss has now repeated the methods and experiments according to which these several compounds have been obtained, and found that the existence of purple oxide, of the hyperoxide (Au_2O_4) and of the auric acid (Au_2O_5) are doubtful, and that for the present we can accept only three stages of oxidation, viz.: aurous oxide (Au_2O); auro-auric oxide (Au_2O_2) and auric oxide (Au_2O_3).—Ber. d. D. Chem. Ges., xix, 2541.

Gold—Compounds with Nitrogen.—Mr. F. Raschig describes three explosive nitrogen compounds of gold, corresponding to the three known and well established oxides of gold. The first is obtained by the action of ammonia on aurous oxide (Au_2O), and has the composition NAu_3NH_3. The second is obtained by the action of ammonia on the auro-auric oxide (Au_2O_2), and has the composition $Au_3N_2+3H_2O$. The third, obtained from the auric oxide (Au_2O_3) or auric chloride, is the well known fulminating gold. It has the formula $2AuN_2H_3+3H_2O$.—Arch. d. Pharm., Nov. 1886, 979; from Lieb. Anal., vol. 235, p. 241.

Potable Gold—Medicinal Uses and Preparations in the Sixteenth Century.—Mr. Robert Modlen communicates some interesting extracts on the uses and preparation of potable gold from the work of Conrad Gesner, translated from the Latin in 1576, and entitled "Newe Jewell of Health."—See Pharm. Jour. and Trans., March 1886, 790.

OSMIUM.

Osmic Acid—Hypodermic Solution and Uses.—Dr. Schapiro uses the following solution:

Osmic acid	0.455
Glycerin	14.20
Distilled water	24.60

This solution should be kept in a black bottle and if carefully sealed will keep for two or three weeks.

For neuralgic affections five drops of the above solution are injected hypodermically near the seat of pain. In some cases the injection must be renewed, but does not produce any dangerous results.—Journal de Pharm. et de Chim., 1886, xiv, p. 519.

NEW METALS.

Germanium—Characters of Compounds.—Respecting germanium, the identity of which appears to be well established, Mr. Clemens Winkler communicates explicit information. Most of the germanium compounds are characterized by their great solubility, giving, therefore, with reagents, none or only insignificant precipitates. Being also devoid of a flame reaction, its discovery was the result of careful experiments, which were made in consequence of a constant difference amounting to 7%, observed in eight analyses of

Argyrodite, a sulpho-salt in which germanium occupies the same relative position that antimony and arsenic occupy in other silver minerals. By the customary treatment of the mineral—melting with sulphur and carbonate of sodium solution, and precipitation with an acid—sulphur alone was obtained as a precipitate. The solution nevertheless contained the new metal, which precipitated, as sulphide, only by a copious excess of acid. The separation from sulphur, precipitated with the sulphide, was effected by treating the precipitate with dilute ammonia, which dissolved the sulphide of germanium together with any As or Sb present. Upon the gradual addition—drop by drop—of hydrochloric acid, the sulphides of antimony and arsenic are first separated, whilst from the filtrate the sulphide of germanium is finally precipitated by hydrochloric acid in form of a snow-white compound. The author states that germanium is the compound, prognosticated by Mendelejeff, fifteen years ago, under the name of

Ekasilicium, a name which the author has been requested by Quesneville, of Paris, to retain, instead of the name given by him. The author points out that the names "Gallium," by Boisbaudran, and "Scandium," by Nilson, should under the same objection be changed to "Ekaaluminium" and "Ekabor" respectively. He describes a number of the compounds of germanium obtained by him (GeO, GeO_2, GeS, GeS_2, $GeCl$, $GeCl_2$, $GeCl_4$ and GeI_4). The most characteristic reaction of germanium is the formation of a white sulphide, resulting after the addition of a little sulphide of ammonia to an alkaline solution of germanium, followed by copious excess of hydrochloric acid.—Arch. d. Pharm., Oct. 1886, 858–860; from Jour. prakt. Chem., 34, 177.

Germanium—Volatility.—The discoverer of germanium, Mr. Cl. Winkler, states that this element appears to be volatilized at a point not far above its melting point=900°. Mr. V. Meyer, however, has been unable to detect any evidence of volatilization even at 1350° either in an atmosphere of hydrogen or of nitrogen.—Arch. d. Pharm., May 1887, 450; from Ber. d. D. Chem. Ges., 1887, 497.

Austrium—A New Metal.—Among the posthumous papers of Mr. Ed. Linnemann there is one describing a new metal, which he had succeeded in isolating from orthite, and which he has named *Austrium.* The new metal gives two violet lines in the spectrum, which are quite characteristic.—Arch. d. Pharm., Aug. 1886, 718; from Monatsh. f. Chem., vii, 121.

ORGANIC CHEMISTRY.

HYDROCARBONS.

(Including Volatile Oils.)

Hydrocarbons.— Occurrence among the constituents of *Beeswax,* which see under "Materia Medica."

Benzol—Action of Anhydrous Sulphurous Acid.—When benzol is treated with sulphuric anhydride one molecule of water is eliminated, and

Diphenylsulfon, $C_6H_5.SO_2.C_6H_5$, is formed.—Messrs. Ch. E. Colby and C. MacLoughlin now find that when benzol is treated with sulphurous anhydride in the presence of chloride of aluminium, an analogous reaction takes place, and the compound

Diphenylsulfoxide, $C_6H_5.SO.C_6H_5$, is produced.—This compound is also obtained when thioxylchloride ($SOCl_2$) is caused to react upon benzol in presence of chloride of aluminium, 2 mol. of HCl being eliminated. Diphenylsulfoxide crystallizes from ligroin in small white crystals, melting at 70–71°, and is easily soluble in alcohol, ether, glacial acetic acid and benzol.—Arch. de Phar., April 1887, 355; from Ber. d. D. Chem. Ges., 1887, 195.

Benzin—Deodorization.—It is recommended that benzin be shaken with an alkaline solution of lead, obtained by dissolving litharge in solution of soda, and then distilling, with a view to removing its odor completely. The efficacy of the method is dependent on the fact that the odorous constituents of the benzin are sulphur derivatives, which are destroyed during the treatment.—Arch. d. Phar., Jan. 1886, 36; from Pharm. Ztg.

Hydronaphthol—Identity with β Naphthol.—The observations of Mr. E. Merck that the so-called hydronaphthol is identical with beta naphthol (see Proceedings 1887, 528) has given rise to some controversy, the manufacturers of the former maintaining that it is a distinct innocuous body, whereas the beta naphthol is, by them, claimed to possess poisonous properties. Mr. E. Merck contributes a further paper in which he shows very conclusively that the two substances are identical; furthermore, that the beta naphthol is not the poisonous body it is asserted to be, physiological experiments made with it in the Pathological Institute in Giessen, proving it to be an innocuous body. On the other hand it proved to be an excellent antiseptic, promoting the rapid healing of wounds without sloughing.—Phar. Rundschau, April 1887, 82–83.

Naphthalin—Use as a Vermifuge.—Dr. Koriander gives children from 1 to 3 years old 0.15 to 2.0 grams twice daily; to adults he gives from 1.25 to 6.0 grams per day in powders with sugar. The author has frequently noticed excellent results from naphthalin when given for tapeworm.—Phar. Zeitsch. für Russl., xxv, 786.

Liquid Paraffin—An Excipient for Hypodermic Injections.—Dr. Mennier-Lyon has discovered that several substances which, owing to their irritating properties, could not be used hypodermically, lose this disagreeable property when dissolved in liquid paraffin, which to be suitable for hypodermic use must be neutral to litmus-paper; heated to 180° C. no vapors should be evolved; sp. gr. at 150° C.=0.870—0.895; it should be odorless and tasteless. If corresponding with the aforesaid properties, a slight fluorescence does not impair its efficacy, although the German pharmacopœia condemns it. Liquid paraffin dissolves only a limited number of oxygenated compounds, but readily dissolves hydrocarbons, ether, chloroform, fats and fatty oils; menthol, thymol, terpinol, etc., are soluble in all proportions. Large quantities of iodine, bromine, phosphorus and iodoform are also soluble in liquid paraffin. According to Bocquillon, it dissolves four times its volume of sulphuretted hydrogen gas, i. e., more than water is capable of dissolving. Oil of eucalyptus produces abscesses when injected subcutaneously, hence eucalyptol (so-called absolute eucalyptol, obtained by distilling oil of eucalyptus at a temperature of 170°—180° C.) only should be used. One part of eucalyptol is mixed with 4 parts of liquid paraffin. 5 grams of this mixture are injected twice daily. The same proportions are used for myrtol. For iodoform the following method is used: 1 gram of iodoform is dissolved in 20 grams of eucalyptol and 100 grams of liquid paraffin. Of this mixture 5 grams are injected twice daily. Carbon bisulphide, 2 to 100 of paraffin oil, is used in same doses.—Phar. Post, xx, 207.

Ichthyol—Characters and Uses.—This derivative from a bituminous mineral containing fossil fish, which has already been noted in these reports (see Proceedings 1884, 247), and the preparation of which has been given, is now further described. It is chemically

Ichthyosulphate of Sodium.—Its aqueous solution is almost neutral, turbid, brown, and has a green fluorescence; it dissolves partly in alcohol and in ether, but is completely soluble in a mixture of the two solvents and in benzol, and is almost insoluble in petroleum-benzin. It has been used internally, the odor being partly covered with coumarin or vanilla, but mostly externally in rheumatism, erysipelas, burns, swellings, and in various eruptions of the skin; the *ointment* made with petrolatum contained from 2 to 50 per cent. of ichthyol. Unna administered it to adults in doses of 1 to 2 gm., and favors its internal use in all affections of the skin.—Amer. Jour. Pharm., June 1887, 293.

Pyrrol—Synthesis.—Messrs. G. Ciamician and P. Silber, having already in former experiments determined that succinimid is convertible into tetrachlorpyrrol (by converting the former by means of gaseous chlorine into bichlormaleïmid, this by pentachloride of phosphorus into the perchloride, and this by reduction with zinc and acetic acid into tetrachlorpyrrol), now find that the latter is readily convertible by heating with iodide of potassium in alcoholic solution, in a flask provided with a reversed condenser, into tetraiodpyrrol. When this is heated with potassa solution and zinc dust, violent reaction follows and pyrrol is liberated, and may be distilled over with the vapor of water.—Arch. d. Pharm., Febr. 1887, 181; from Ber. d. D. Chem. Ges., 19, 3027.

Terpenes—Relation, etc.—It appears beyond doubt that a group of the terpenes $C_{10}H_{16}$ is the first product of the polymerization of the fat hydrocarbon C_5H_8, which, by further polymerization, may be converted into $C_{15}H_{24}$, $C_{20}H_{32}$, etc. These sesquiterpenes and polyterpenes require further study. Mr. O. Wallach has now obtained pure

Sesquiterpene from oil of cubeb. When this sesquiterpene is treated with gaseous HCl to saturation, the compound $C_{15}H_{24},2HCl$, melting at 117–118°, is formed. By heating this compound with anilin, hydrochloride of anilin is formed, and the sesquiterpene is liberated and may be distilled. It boils at 274–275°, is with difficulty soluble in alcohol and glacial acetic acid, but readily in ether and chloroform. If its solution in the latter is treated with a few drops of concentrated sulphuric acid and shaken, an intensely green color is communicated to the chloroform, then blue, and, on heating, red. The blue color is most magnificently developed if the sesquiterpene is dissolved in much glacial acetic acid, and a little sulphuric acid is gradually added. The author obtained sesquiterpene also from the volatile oils of patchouly, galbanum, savin and cade.—Arch. d. Pharm., May 1887, 453; from Liebig's Annal., vol. 238, 89.

Terebene—Characters of the Commercial Article.—Messrs. H. W. Jayne and G. H. Chase, after reviewing the literature on terebene, conclude that its precise characters are difficult to establish, inasmuch as the description of different authors offers a great latitude of opinion. They consequently assumed that the commercial article bearing this name would vary much in its composition, and with the view to ascertain the correctness of this assumption they purchased samples from leading drug houses. They found it popularly believed that the European articles were the purest to be had. Among others, they purchased a very fine-looking English preparation, which is recommended by an authority on throat affections, but as the table shows this was one of the poorest in the market.

The following table was prepared after a careful examination of the material for sale by first-class druggists—great care being exercised in each case to obtain the terebene in its original packages so as to insure its authenticity. The rotation in the following is for 10 cm. of liquid and the mean of six readings. The gravities were taken at 14° C.

No.	Origin.	Rotation.	Gravity.	155°	160°	165°	170°	175°	180°	185°	190°
1	Turpentine.	14° 11′	0.872	3⅚	84⅚	91⅚	96⅚				
2	"	12° 8′	0.882	15	71	86	87	88			
3	"	11° 17′	0.872	0	85	92	96				
4	"	9° 54′	0.872	0	85	92	96				
5	German.	9° 3′	0.910	4	50	64	74	79	82		
6	(?)	8° 15′									
7	English.	7° 58′		0	57	78	86	92	96		
8	American.	1° 44′	0.865	0	10	31	58	76	86	90	92
9	"	1° 20′		6	16	43	70	83	90		
10	German.	0° 58′	0.875	0	59	78	87	92	96		
11	"	0° 26′		0	48	72	82	92			
12	"	0° 18′	0.860	0	0	0	36	74	87	91	95
13	American.	0° 3′	0.860	0	0	0	40	78	91	96	

For convenience of comparison they have added the tests of four commercial turpentines. No. 5 is a terebene, slightly yellow, with smell of turpentine; above 183° this sample decomposed and left a thick resin.

No. 7, a very clear water-white article, smells of turpentine.

No. 13 was prepared by the authors.

It will be seen by a careful inspection of the above table that the determination of the specific gravity and boiling points are of little value in estimating the purity of terebene. The smell also has no direct bearing on the purity, as the odor of turpentine is masked when mixed with its own weight of terebene. The only reliable determination of purity is the test with the polariscope, together with the absence of fractions above 190° C.

If the mean rotation of commercial turpentines is taken at 12°, then the samples Nos. 7 and 8 would contain respectively about 75, 65 and 15 per cent. of turpentine oil. No reliance, however, can be placed on such calculations to determine the *exact* amount of turpentine oil contained in commercial articles, as the rotation of turpentine itself varies so greatly. It should not be supposed from the above that turpentine oil has been added as an adulterant, but merely that it has been insufficiently acted on by the acid. To reduce the rotation to about one degree, the reaction may be conducted with comparative ease and large yields; but to remove the last traces great care must be observed, and at the same time the yield is very much reduced. Whether these articles are impure from a lack of knowledge or a desire to obtain larger yields it is difficult to say; yet surely some of the samples purchased by us in the open market are bad beyond reasonable limit.—Amer. Jour. Pharm., Febr. 1887, 65–68.

Terebene—Unsatisfactory Characters of the Commercial Article.—Mr. W. Lascelles-Scott draws attention to the unsatisfactory characters of commercial terebene. He examined fifteen samples, and found them impure with few exceptions; some leaving a resinous layer on evaporation, some whitening the cork of the containing vial (presence of peroxide of hydrogen), whilst others contained unchanged oil of turpentine, the three conditions being frequently united in the same sample. All the samples were labelled "Pure Terebene." Subjected to the optical test by Mr. John Hodgkiss, they were found to be optically active with the exception of one and possibly a second sample. Pure terebene should be optically inactive.—Yearbook of Pharm., 1886, 531–533 and 534–535.

Terpin—Explosion During its Manufacture.—In one of the Parisian laboratories undue haste in making terpin, for which there have been large demands and consequent unusual efforts to supply it, led to a vigorous explosion. The mixture used in the manufacture consists of 72 litres of the oil of turpentine, 50 litres of alcohol, and 17 kilogm. of nitric acid. The liquid is usually cooled rapidly in stone jars set in water, but as the demand was great, and the jars were all full, a supplementary mixture was poured in a cask, set in cold water, to cool off! The wood did not conduct the heat away rapidly enough, and the explosion was very violent; the cask was driven through the roof, where it burst, scattering its contents throughout the laboratory. No one was injured, strangely enough, but the circumstance contains a lesson for manufacturing chemists to remember.—L'Union Pharm., April, 1887.

Terebinthina—Nitrogenous Derivatives.—Mr. Ch. Tanret, describing the method of obtaining *Terepine*, or the bihydrated essence of terebinthina, points out that under the conditions of the reaction a portion of the essence combines with the elements of the nitric acid employed, and forms certain nitrogenous derivatives, whose presence has been frequently pointed out, but the nature of which has not hitherto been studied. His present paper records his studies upon these bodies. The compounds formed are crystalline and are divisible into two groups, the

Hydrazo-Camphines and *Dihydro-Camphines*, the first having the general formula $C_{10}H_{17}NO_2$, the second the formula $C_{20}H_{34}N_2O_2$. There are several isomeric modifications of each of them. Both forms are capable of forming salts, and they may be compared with certain alkaloids, notably those having a neutral reaction, such as narcotine, ergotinine, and caffeine.—Pharm. Rec., May 1, 1887, 133.

Volatile Oils—Detection of Oil of Turpentine by the Aid of Guaiacum Resin.—Dr. H. Hager, in 1885, published a pamphlet entitled "Chemical Reactions for the Determination of Oil of Turpentine in the Volatile Oils, in Balsams, etc.," in which he particularly recommends and describes a reaction based upon the ozonizing effect of oil of turpentine upon guaiaconic acid—one of the components of guaiac resin. He has since simplified and improved the method, the objects and details of which are given in a lengthy communication in "Archiv der Pharmacie" (Nov. 1886, 913–928), and of which the following is a brief resumé. Dr. Hager divides the volatile oils into: (1) ozone-producing or *ozonoprothym* oils; (2) indifferent or *adiaphoric* oils; and (3) ozone-preventing or *antiozonoprothym* oils. The most powerful ozone-producing oil is the so-called French oil of turpentine (*ol. Pini Laricis*). Other turpentine oils (*ol. Pini silv.*, *ol. Pini pumilionis*, etc.), are also ozone producers, but not near as powerful as the French oil, and it is therefore quite possible to distinguish these by the author's method, as well as other ozone-producing oils. In like manner the ozone-preventing oils vary in their power to prevent the formation of ozone, and their action in this respect is easily distinguished. The author's reaction is based on the fact that guaiaconic acid produces a blue color when acted upon by ozone, and he designates it as the

Guaiac Reaction.—This reaction cannot, however, be made with ordinary alcoholic tincture of guaiac resin, benzolic tincture containing guaiaconic acid to the exclusion of most of the other components of guaiac resin being necessary, and even these tinctures do not produce the reaction unless in the presence of some *stimulant* to incite the formation of ozone; such stimulants being oil of citronella, amyl-alcohol, ethyl-alcohol, some kinds of calamus oil, spike oil, etc. Owing to the uncertainty of purity of oil of citronella—the *stimulant* recommended by Dr. Hager in his first communication—he now recommends the use of amyl-alcohol, supplementing this in doubtful cases by ethyl-alcohol. It may be stated here also, once for all, that in the preparation and preservation of the guaiac reagents, as well as throughout the various steps of the process of testing, direct as well as diffused daylight must be carefully excluded. The preservation of the reagents should be in the dark, and the reactions should take place in the deep shade; the examination from time to time, being only momentary, may be made in diffused light.

The author employs two benzolic tinctures of guaiac resin, prepared as follows:

(1) *Benzolic Tincture of Guaiac Resin.*—3 grams of recently powdered *crude* guaiac resin and 1.25 gram of recently powdered *purified* (depuratum) guaiac resin are added gradually with constant agitation to 120 cc. of coal-tar benzol contained in a flask, the object being to prevent the adherence of portions of the resin to the sides of the flask. The flask is shaken every ¼ to ½ hour for ½ to 2 days, any deposit formed being scraped off with a glass rod. The liquid is finally allowed to subside, decanted *(not filtered)* and preserved in well-corked vials. A slight turbidity of the tincture does not affect the reaction.

(2) *Benzolic Tincture of "Crude" Guaiac Resin.*—This is prepared from 4 grams of *crude* guaiac resin and 120 cc. of coal-tar benzol, precisely like the above. The author observes that this second tincture may be used to the exclusion of the other, since, though slower in being acted on, it answers for all the reactions. The advantage of the first tincture is the greater rapidity of the reaction.

The test is made as follows: Two small reagent glasses (test tubes) of equal calibre being provided, the one is designated as *A*, the other as *B*. Into

A, 10 drops of the volatile oil to be tested is placed, followed by about 2 cc. of the *benzolic tincture of guaiac resin* (No. 1) and 10 drops of amyl-alcohol. Into

B, the same liquids are placed, with the addition of 2 drops of rectified oil of turpentine (French ? Rep).

After thoroughly mixing the contents of the two test tubes by rotary motion, they are loosely corked and placed in the dark; observation being made at intervals of from 5 to 5 or 10 to 10 minutes, noting the time when a blue coloration is developed in the one and the other. The object of making the test *B* is, as is readily inferred, to control the reaction in *A*.

Most volatile oils that are free from oil of turpentine retain the original color of the mixture, whilst in the case of *B*, a blue color is developed in 5–10–20 minutes; and even if a blue color is produced in *A* 20 or 30 minutes after it has made its appearance in *B*, the sample can be accepted as being free from oil of turpentine. In the test for ozone-producing oils other than *ol. Pini Laricis*, the *tincture of crude guaiac resin* is employed by the author. The author communicates a long list of volatile oils in which their relations to the reagent are indicated, together with many details, for which reference must be had to his original paper in Arch. d. Pharm., Nov. 1886, 913–928.

Volatile Oils—Relative Affinity for Iodine.—The well known difference in the reaction of iodine with different volatile oils, some becoming simply warm, others decidedly hot, while others react with explosive violence, has led Mr. C. Barenthin to undertake a series of experiments with a view to determine the relative affinity of volatile oils for iodine. He finds that these oils are capable of decolorizing certain proportions of iodine, such proportions varying according to the volatile oil employed, and has obtained figures which may serve for the identification of purity of the oil under examination. For the experiment a solution of iodine and mercuric chloride (50 grams of each per litre) in alcohol, free from fusel oil, and a solution of hyposulphite of sodium (24 grams per litre) in water, a 10 per cent. solution of iodide of potassium, and a little starch paste, are employed. The titre of the iodine-sublimate solution must be established for each series of experiments. The experiment is made by dissolving 0.1–0.2 of the volatile oil in 10 cc. of chloroform, adding 25 cc. of the iodine-sublimate solution, and, if decolorization occurs in a short time, a few cc. more. The mixture is then allowed to stand for three or four hours, after which 10–15 cc. of the iodide of potassium solution are added, then diluted with 150 cc. of water, and titrated with hyposulphite solution until it remains colorless for about one minute. The amount of unconsumed iodine is then determined, and the amount consumed by subtraction from the total quantity employed. In this way the author has obtained numbers which represent the relative proportions of iodine consumed by different volatile oils, as enumerated in the following:

	Iodine Number.	Reaction with Iodine.
Ol. Terebinthinæ	300	Explodes.
" Citri	285	"
" Caryophyll	270	Faint reaction.
" Carvi	265	"
" Bergamottæ	260	Explodes.
" Juniperi	245	"
" Eucalypti	235	"
" Origani	227	Becomes heated.
" Macidis	215	Explodes.
" Rosmarini	185	Becomes heated.
" Thymi	170	"
" Anisi	164	"
" Lavandulæ	170	Explodes.
" Calami	155	Faint reaction.
" Fœniculi	140	"
" Salviæ	105	Becomes heated.
" Cinnamomi	100	Faint reaction.
" Valerianæ	80	"

The author's results possess high interest, and point out a possible method for establishing the identity and purity of at least some of the volatile oils. It is particularly interesting to note that some of the oils that possess a strong affinity for iodine, as shown by the iodine number, are not heated strongly or explosive (clove and caraway oils), while others, that have a comparatively low affinity (lavender) explode in direct contact with iodine.—Arch. d. Phar., Oct. 1886, 848–851.

Essential Oils—Specific Refractive and Dispersive Power.—Mr. J. H. Gladstone, in a paper read before the Chemical Society of Great Britain, brings forward arguments founded on the phenomena of refraction and dispersion, believing that in the conflict of opinion such arguments ought to have considerable force. For this purpose he employs the refraction equivalent of the solar line *A*, as compared with that calculated from the known values of carbon and hydrogen, and the known increase on account of the double linking of carbon atoms. But he also introduces a new conception, that of dispersion equivalents: being the difference between the refraction equivalents for the lines *A* and *H*, or $P\frac{\mu H-\mu A}{d}$ where μ and *d* are the refractive index and relative density, and *P* the atomic weight. It is found that the dispersion equivalent of carbon may be taken at 0.25, and that of hydrogen at 0.045, as a first approximation, while in the case of benzenoid compounds the addition to be made to the dispersion equivalent on account of each double linking of carbon atoms is fully 0.8. The author's paper deals mainly with the hydrocarbons $C_{10}H_{16}$. These are divisible on account of their physical and chemical properties into two large groups, the terpenes and the citrenes. There are also the solid camphenes and the cedrenes, or $C_{15}H_{24}$ hydrocarbons. The optical properties of the terpenes are in close accordance with what may be expected from a compound in which one pair of carbon atoms is double-linked; those of the citrenes indicate two pairs; while camphene has a slightly slower specific refraction and dispersion than terpene. The cedrenes appear to be strictly polymeric with the terpenes from an optical point of view.

The optical properties of caoutchene were also examined. Its principal constituent resembles the citrenes; so also does the liquid hydrocarbon, $C_{10}H_{16}$, that is produced by its dry distillation. Isoprene, C_5H_8, also, must have two pairs of its carbon atoms double linked, a result which agrees with Tilden's conclusions from its chemical properties. The author's observations are exhibted in the following table:

	Refraction equivalent.		Dispersion equivalent.	
	Observed.	Calculated.	Observed.	Calculated.
Terpenes, natural	73.0	73.0	4.0	4.02
Terpenes, artificial	72.9	73.0	3.9	4.02
Camphene	71.9	73.0	3.7	4.02
Cedrenes	109.8	109.5	6.1	6.03
Citrenes, natural	75.0	75.2	4.5	4.82
Citrenes, artificial	75.1	75.2	4.6	4.82
Caoutchene	75.3	75.2	5.0	4.82
Isoprene	40.3	39.8	3.2	3.21

Armstrong's cymhydrene ($C_{10}H_{20}$), Atkinson's menthene ($C_{10}H_{18}$), citrene ($C_{10}H_{16}$), and cymene ($C_{10}H_{14}$), form a series: the first being a saturated compound, and the others having respectively one, two and three pairs of carbon-atoms double-linked.—Pharm. Jour. and Trans., July 3, 1886, 16.

Essential Oils—Value of the Polariscope as a Revealer of Adulterants.—Mr. Albert M. Todd draws attention to the value of the polariscope for the detection of foreign oils as adulterants of essential oils. He regards it marvelous that this instrument as an investigator of essential oils is so little known and understood. The standard and official books of reference (pharmacopœias and dispensatories) are entirely silent as to the polarizing test on many essential oils; and when it is mentioned, give only the fact as to the oil being dextrogyre—polarizing to the right, or lævogyre—polarizing to the left, the *angles of polarization*, which are of the most vital importance, not being referred to. The author records his results with a Mitscherlich polariscope of especially fine construction, which have proved that though different pure samples of essential oils varied in the angle of polarization, there were found to be *limits* beyond which pure samples did not go. In the case of oil of peppermint adulterated with oil of camphor (the latter is dextrogyre, while the former, as is well known, is lævogyre), a most valuable test was found by polarization, especially valuable from the fact that oil of camphor, being so soluble, limpid and volatile, and yielding no distinct chemical reactions, had recently become the most dangerous adulterant known, being used to an enormous extent.

Beside the value of the polariscope in determining adulterations of lævogyre essential oils with oil of camphor, it is also most valuable in determining adulterations of *oil of erigeron* with oil of turpentine, as the former is lævogyre; also in determining the genuineness of oil of *true fireweed*, for which, heretofore, erigeron oil has been mostly substituted, and for which no chemical test had yet been known; while oil of erigeron polarizes about 50° to the left, the oil of true fireweed (Erechthites hieracifolia) polarizes at 44° to the right; consequently those oils, which heretofore have been difficult to distinguish on account of similar chemical and physical tests (though varying greatly therapeutically), can now be readily distinguished.—Amer. Jour. Pharm., April 1887, 161–166.

Volatile Oils of the Aurantiaceæ—Distinction.—According to Noel the different volatile oils of the *aurantiaceæ* may be distinguished from each other in the following simple manner: (1) 5 drops of the oil are placed into a dry test tube, shaken with 1 cc. of pure concentrated hydrochloric acid, and the coloration noticed. (2) After one minute 7 to 8 cc. of 90 per cent. alcohol are added, whereby the color is changed, increased or decreased. The reactions in the case of the different oils are as follows:

Essence de Néroli Amer. (1) Orange-yellow. (2) Yellowish, rapidly changing to a light permanent rose red.

Essence de Néroli Doux. (1) Brown-red. (2) Yellowish, rapidly changing to permanent light rose color.

Essence de Petit Grain. (1) Light orange-yellow. (2) Colorless.

Essence de Portugal, Essence d' Oranges Amères. (1) Lemon-yellow. (2) Colorless.

Essence de Cédrat Distillée, Essence de Bergamotte Distillée. (1) Dark-brown. (2) Violet, changing in the case of cédrat rapidly to brownish-green.

Essence de Citron Distillée. (1) Orange-red. (2) Light violet, soon bleaching.

Cedrat, Citron, Bergamotte par Expression. (1) Lemon-yellow. (2) Colorless. To distinguish these three oils from each other, the sample is heated with the hydrochloric acid for one minute.

In the case of *cedrat* a dark orange color is produced, changing to turbid yellow on addition of alcohol. Under the same conditions *citron* becomes first light orange, then light rose, and *bergamotte* light orange, and on addition of alcohol, dark rose colored.—Arch. d. Pharm., Aug. 1886, 723; from Journ. Pharm. Chim., xiii, 415.

Volatile Oil of Black Pepper—Composition.—Mr. L. A. Eberhardt has subjected the volatile oil of black pepper to study respecting its composition. His results lead him to the conclusion that this oil is composed of feebly dextro-rotatory terpen, and of isomeric compounds having higher boiling points.—Arch. d. Phar., June 1887, 515–519.

Oil of Peppermint—Specific Gravity.—Mr. G. M. Beringer observes that three samples of American oil recently examined, showed varying densities; Hotchkiss' oil sp. gr. .9074, rich in menthol; one of A. M. Todd, sp. gr. .9074, not quite so rich in menthol; and a sample of another Western distiller sp. gr. .9112, contained but a small quantity of menthol, being undoubtedly a skimmed oil. These figures correspond closely with the statement of Mr. Todd in his article on the subject of "Oil of Peppermint," read at the last meeting of the American Pharmaceutical Association (see Proceedings 1886, 121–127). Mr. Todd states that pure oil of peppermint is never below 0.908 sp. gr., nor when fresh and soluble above 0.917, so that the difference formerly allowable, that is from 0.840 to 0.950, is made ten times as small.—Amer. Jour. Phar., June 1887, 285.

Oil of Peppermint—Use of the Polariscope to Determine Adulterations.—Dr. Samuel P. Duffield contributes an interesting paper on the use of the polariscope for the detection of adulterants in oil of peppermint. The oil of peppermint being laevogyre, the most dangerous adulterants, are those having also laevorotatory power, such being for instance the French oil of turpentine. Fractional distillation, determination of boiling point, etc., must in such cases be brought into service. The details of the author's paper will be consulted with interest in Pharm. Era, March 1887, 67–68.

Oil of Peppermint—Test to Determine the Abstraction of Menthol, etc.—Mr. E. C. Federer communicates the results of a large series of experiments made to develop a reliable method for the determination of the abstraction of menthol and of the presence of foreign oils in oil of peppermint. He finds that when 1 volume of good oil of peppermint containing the normal quantity of menthol as it is usually found to be in natural oil, is mixed with 2 volumes of alcoholic potassa solution, and in about 10 minutes afterwards 1 volume of water is added, the mixture separates into two equal parts, each representing 2 volumes. If menthol has been added to the natural oil, then the supernatant layer will be *larger* in proportion to such addition; if menthol has been abstracted from the natural oil, the two layers will also be of unequal size, the upper layer now being *smaller*, and the same effect results when the natural oil has been mixed with a foreign oil not containing a menthol-like body. The author bases his method on these observations, and records the results obtained by it in form of a tabulated statement.—Pharm. Era, February 1887, 36–38.

Oil of Peppermint—Influence of Drying and Exposing the Plant to Atmospheric Air.—See *Peppermint* under "Materia Medica."

Oil of Peppermint—Spurious Article from Michigan.—Mr. Albert M. Todd draws attention to a peppermint oil that has been sold in England as *Michigan* oil, pretending to be manufactured at "Evart, Michigan County, U. S. A." The sample was fractioned by him and found to be composed of 50 per cent. of oil of turpentine, 43 per cent. of oil having the odor of peppermint, and 7 per cent. of solid resin.—Amer. Drugg., Sept. 1887, 161–162.

Thymol—New Reaction.—Mr. R. Stromer observes that when thymol is dissolved with heat in a moderately concentrated solution of potassa and a few drops of chloroform are added, an immediate violet color is produced, which on shaking passes to a magnificent violet-red. The reaction is only produced by the aid of heat; 0.01 gram thymol may thus be readily recognized.—Arch. d. Pharm., Jan. 1887, 36; Pharm. Ztg., 1886, 31, 744.

Thymol—Tænifuge Properties.—Dr. Numa Campi recommends thymol as a tænicide and tænifuge, its action being simple and rapid, and unaccompanied by any disturbance, except a depressing effect, easily counteracted. In the evening he ordered 20 gm. (ʒv) of castor oil to be taken fasting; in the morning he prescribed 8 gm (ʒii) of thymol, divided into twelve doses, one to be taken every quarter of an hour; twenty minutes after the last dose had been swallowed, another 20 gm. (ℨv) of castor oil were taken. A few minutes after a *tænia medio-canellata* three and a half meters in length was evacuated, the head being dead. The depressing effects were promptly counteracted by the use of stimulants, cognac and rum being suitable for the purpose.—Amer. Jour. Pharm., Jan. 1887, 20; from Buffalo Med. Jour., Oct. 1886.

Camphor—Historical Notes.—Prof. F. A. Flückiger has contributed some interesting historical notes on camphor, to which reference may be had in Arch. d. Pharm., July 1886, 625–627.

Camphor—Production of a Dextrogyre Variety from Thymene.—Mr. Lextreit has obtained a true camphor—a borneol—having the composition of $C_{10}H_{18}O$, by treating thymen picrate with boiling soda solution, and subliming the product. Like borneol, it is capable of conversion into camphoric acid, and of forming a hydrochloric ether.—Arch. d. Pharm., 1886, 552; from Jour. Pharm. Chim., 1886, 265.

Valerian Camphor—Isolation and Characters.—Mr. Haller has separated valerian-camphor from oil of valerian by fractional distillation, boiling the fraction passing between 220° and 250° with a small excess of alcoholic solution of potassa for several hours, then pouring the mixture into a large quantity of cold water, collecting the camphor separated, washing with water, drying between paper, and subliming over lime. Valerian camphor melts at 208°, crystallizes from its solution in petroleum ether in colorless, six-sided plates, reminds in its odor of camphor, pepper and valerian, and corresponds, in its relation to polarized light, with *N'gai camphor*, with which also the monobrom-camphor and camphoric acid prepared from it correspond completely.—Arch. d. Pharm., Nov. 1886, 940; from Journ. de Pharm. et de Chim., 1886, xiv, 241.

Eugenol—Value as an Antiseptic.—Attention is drawn in Pharm. Zeitschr. f. Russl. (xxv, 723), to the value of eugenol—the principal component of oil of cloves—as an antiseptic. Eugenol is described as an oily, colorless liquid, possessing the odor and taste of oil of cloves in the highest degree. In contact with air and light it soon acquires a brown color; it boils at 247.5° C., and has a specific gravity of 1.078 at 0°, and 1.063 at 18.5° C. Like phenol, which it resembles very much, it has no acid reaction, does not contain the group COOH, and also forms crystallizable compounds with alkalies. When heated with hydriodic acid it evolves methyl iodide, and when fused with potassium hydrate, it forms protocatechuic acid $C_6H_3(OH)_2COOH$; with baryta and tin-dust it forms about 10 per cent. methyl-eugenol. When taken internally the greater part of it is eliminated by the urine, in which however it cannot be detected by its odor nor by distillation, but, if allowed to decompose, the characteristic odor is at once perceptible, and when extracted with alcohol shows the characteristic deep-green coloration with ferric chloride. Eugenol has been given in doses of 3 grams per day dissolved in alcohol and diluted with water. As an antiseptic, it is superior to phenol; as a febrifuge, it is not as efficacious as quinine, salicylic acid, antipyrine or thalline.

Safrol—Distribution.—Professor Flückiger draws attention to the distribution of safrol, the crystalline constituent of oil of sassafras, in other plants than sassafras. While there is little doubt that this is so, the absolute fact has hitherto remained to be proved. He expresses the opinion that safrol is contained in the volatile oil of *Mespilodaphne Sassafras*, Meissner, a Brazilian tree, the bark of which has the characteristic sassafras odor. The same odor also pervades the so-called Puchury nuts, or sassafras nuts, the cotyledons of two Brazilian species of *Nectandra*. Two monimінaceous plants, belonging to the tribe *Atherospermeæ*, would also appear to be provided with safrol, viz.: The bark of *Atherosperma moschatum*, Labillardière, a tree indigenous to Australia and Tasmania, and the bark of *Doryphora Sassafras*, of New Caledonia. The absolute determination of safrol has, within the past few years, been accomplished by the well-known house of Schimmel & Co., of Leipzig, with regard to the oil of the camphor tree. This firm has manufactured safrol from the camphor-oil of *Cinnamomum Camphora* since 1885, in large quantities. Two other species of *Cinnamomum*, *C. Parthenoxylon*, Meissner, and *C. glanduliferum*, Meissner, Prof. Flückiger observes, are characterized by their odor resembling that of true sassafras. Finally the bark of an Australian tree, originally described by Bentham, under the name of *Nesodaphne obtusifolia*, but now called *Beilschmiedia obtusifolia* by Bentham and Hooker, has an odor very strongly resembling that of sassafras.—Pharm. Jour. and Trans., June 4, 1887, 989–990.

Carvol—Products of Change.—Messrs. H. Goldschmidt and E. Kisser have obtained a new base,

Carvylamine, $C_{10}H_{15}NH_2$, by reducing carvoxim ($C_{10}H_{14}NOH$) with sodium amalgam and glacial acetic acid. Carvylamine is a colorless fluid having a strong aromatic odor. The hydrochloride is a white crystalline powder, easily soluble in water, and crystallizing from its alcoholic solution in fine silky-glistening needles. The authors also obtained

Hydrochlor-carvol, $C_{10}H_{15}ClO$, by passing a current of dry HCl into pure carvol for one hour, mixing the product with water, shaking out with ether, and removing the last traces of free HCl by repeatedly shaking the ethereal solution with water. After drying in a vacuum the hydrochlor-carvol constitutes a brownish oil.—Arch. d. Pharm., May 1887, 449; from Ber. d. D. Chem. Ges., 1887, 486.

Volatile Oils of Erigeron and Fireweed—Characters of Distinction.—Mr. Albert M. Todd communicates a comprehensive paper detailing a large number of experiments made with a view to determine the characters of the volatile oils of *Erigeron canadense* and of *Erechthites hieracifolia*. Omitting the details of the author's experiments, the conclusions drawn are the following:

1. Polarization. Pure oil of erigeron in the natural state should not polarize nearer the zero point than — 26, nor farther than — 60; rectified oil freed from resin may polarize some nearer the zero point than the limit given, and the first fractions should be dextrogyre. Pure fireweed if lævogyre should not polarize farther than — 4, and if dextrogyre farther than + 4.

2. Specific gravity. Pure natural oil of fireweed, unless resinous (which may be noted by leaving a stain upon paper when evaporated), should not possess a sp. gr. above .855, nor below .845; and erigeron under like circumstances not above .865, nor below .855—the difference in sp. gr. being about .010.

3. Boiling point. The temperature of the *vapor* being taken, fireweed should not vaporize to any marked extent below 355°; nor should this temperature be increased more than 10° F., until five per cent. of the oil has been evaporated. Erigeron should not boil vigorously below 342° F., nor above 347° F., until five per cent. has been volatilized.

4. Resinoid. When distilled with water or steam, the resinous product of erigeron is a deep reddish-brown; that of fireweed a light straw color. The effect of rectification by steam with both is to produce a brilliant and colorless oil. Both oils possess characteristic odors. As these cannot be well described, the author may find occasion to comply with the requests made that samples of both shall be furnished the different pharmaceutical colleges and associations of the country, where those interested may have an opportunity of comparing for themselves both oils in a state of purity.

The investigations recorded are by no means considered complete or sufficient, and it is hoped that farther research will develop some tests which may be both efficient and easy of application. The need is evident from that fact that the author has not been able to find in the hands of a pharmacist, except in the rarest instances, a sample of the oil of true fireweed, which showed by its odor even a trace of the oil.—Amer. Jour. Pharm., June 1887, 302–311.

Oil of Erigeron—Specific Gravity.—Mr. G. M. Beringer, having occasion to examine some oil of erigeron, the specific gravity was carefully ascertained, at the temperature of 60° F., with the 1000 grain bottle; it proved to be 0.8454. The gravity given by the U. S. Pharmacopœia is 0.850; Professor Procter's experiments, in 1854, place it at 0.845. The figures correspond very closely, and within a limit that may be accounted for by the age of the oil.—Amer. Jour. Pharm., June 1887, 285.

Oil of Erigeron—Medicinal Uses.—This oil has been observed by Dr.

Bartholow to check the waste of albumen, to lessen the irritability of the bladder in cystitis, and to afford considerable relief in bronchial catarrh and similar affections. It was usually given in doses of five drops, every three or four hours.—Physic. and Surg., April 1887.

Oil of Rose—Test of Purity.—Dr. G. Heppe observes that the most common adulteration of oil of rose is that with oil of rose-geranium, which in ordinary cases may be discovered by nitric acid, which modifies the odor more or less. If we add sufficient solution of potash to neutralize the nitric acid, then the color of those oils the odor of which has been altered very little, will turn to yellow. A yellow mass floats on the surface and the deposit amounts to but little. On the contrary, the color of those oils which acquire a distinct foreign odor will, after neutralization of the acid by the potash, turn dark brownish yellow; only little of a yellow mass floats on top, while the deposit will be large. Of all the different oils which the author has examined, none proved to be absolutely pure; all had their odor modified, although some of the samples very little so. However reliable the nitric acid test is for the ordinary adulteration with oil of rose-geranium, it does not discover it in all cases, since in distilling the finest quality of oil of rose, the Bulgarians impregnate the rose leaves previous to distillation with fine oil of rose-geranium, which thereby gets the benefit of a double distillation and an intimate blending with oil of rose, so that nitric acid has scarcely any appreciable action on such an oil. It is stated that this admixture can be discovered during the distillation; without admixture, the water comes over comparatively clear, while in the presence of oil of rose-geranium, the water is decidedly turbid (milky). The iodine test seems to give quite reliable results, if the test is applied every time under identical circumstances. This test is applied by placing a watch glass containing a small quantity of iodine, surrounded by watch glasses, each with one or two drops of the different oils to be examined, under a bell jar; after six to twelve hours the effect is noted. It has been stated that the pure oil is never acid, while the oils of palma-rosa and of rose-geranium always have an acid reaction. The author proposes to use a solution of phenol-phthalein which better than litmus paper will show acidity; it will, however, be necessary to add the undiluted oil to the solution of phenol-phthalein, and not add the latter to an alcoholic solution of the oil, since most of the commercial alcohol has a faintly acid reaction. All the oils which the author had occasion to examine, stood Hager's test with concentrated sulphuric acid and subsequent addition of alcohol. Since most buyers put a strong but unjustified reliance on the solidifying test, it is to be presumed that a fraudulent addition of spermaceti has been made to an oil which has been largely adulterated with oil of rose-geranium, because the presence of the latter oil diminishes the solidifying tendency of the oil of rose. He proceeds as follows: Shake the oil to be tested with 1½ to 2 times its bulk of liquefied glacial acetic acid; after a few minutes the mixture will form a crystalline mass, which is then transferred to a small filter, and washed repeatedly with glacial acetic acid and lastly with water till the odor has nearly disappeared; wash now with a little solution of carbonate of sodium, and finally with water. The insoluble mass which remains on the filter will be found to consist chiefly of spermaceti. In order to identify it, transfer the dry mass to a dry test tube, and heat till it acquires a brownish color; an empyreumatic odor of burning fat shows spermaceti.—Drugg. Circ., Dec. 1886, 269; from Chem. Techn. Central-Anz.

Oil of Bay—Specific Gravity.—Mr. G. M. Beringer observes that the sp. gr. of this oil is stated in the U. S. Pharmacopœia, as about 1.040. A sample obtained from an American distiller, who guaranteed the purity, showed a sp. gr. of 0.9750; another sample from a St. Thomas distiller, showed 0.9945; both of these oils were of fine odor and appearance, and would indicate that the Pharmacopœia had stated the sp. gr. a trifle high.—Amer. Jour. Pharm., June 1887, 286.

Oil of Gaultheria—Synthetical Product.—Mr. Charles Bullock draws attention to synthetical oil of gaultheria, which is now found in commerce. It is colorless, sp. gr. 1.176, b. p. 398° F. The odor of the oil closely resembles that obtained from the plant; when agitated with water the same reaction is afforded on addition of chloride of iron as is given by the natural oil. It may be distinguished from the natural oil by agitating a few drops with water in a tube; a tinted mixture is formed from which the oil does not separate for some time; the oil from the plant when agitated with water separates almost immediately in clear drops. The artificial oil contains a small amount of what appears to be methyl ether, which tends to suspend the oil in water; repeated washing removes most of this product, after which the oil settles more quickly.

Some experiments were made by Mr. Geo. M. Beringer on the manufacture of the oil, using the following formula:

Salicylic acid	½ oz.
Methylic alcohol, absolute	2 fl. oz.
Sulphuric acid	1 fl. oz.

Dissolve the salicylic acid in the alcohol, then add gradually the sulphuric acid; warm gently during 24 hours; then distil from a retort into which a current of steam is introduced.—Amer. Jour. Pharm., Jan. 1887, 8.

Volatile Oil of Mustard.—Quantitative determination in *Mustard Paper*, which see under "Pharmacy."

Volatile Oil of Mustard.—Conversion into semi-sulphurated allylurethane at the ordinary temperature in old *spiritus sinapis*, which see under "Pharmacy."

Allyl Tribromide—Preparation and Characters.—According to Prof. Wurtz, tribromide of allyl is a new substance obtained by treating one part of allyl iodide with two and a half parts of bromine. Allyl tribromide is a colorless liquid, soluble in ether of the density of 2.436 and boiling point 217° C. Dr. Armand de Fleury has used it in hysteria, asthma, croup, etc., with success. Dose: for hypodermic injection 2 to 4 drops in 1 or 2 cc. of ether, or 5 drops in a capsule twice or four times daily.—Rundschau, Prag, xii, p. 731.

Coniferin—A New Reagent for its Determination.—Mr. Hans Molisch recommends a reagent prepared by diluting a 20 per cent. thymol solution in absolute alcohol with water as long as it remains clear, adding excess of potassium chlorate, and filtering after several hours. On moistening lignified tissue with this liquid and then adding a drop of concentrated hydrochloric acid, a blue-green color is produced in a few seconds even in the dark. In this respect it is preferable to Tiemann and Haarmann's reagent (1874) which succeeds best in direct sunlight, a yellowish-green, blue-green or sky-blue color being produced by phenol and hydrochloric acid. The reaction is readily obtained with wood-pulp paper, and over one hundred herbaceous and woody plants which were tested yielded the coloration, which appeared only in the lignified cells, notably in the cell-walls of the wood, then in the pith and bast cells. The coloration is not always alike in intensity, which is doubtless due to the variable proportion of coniferin, and it is in some cases masked to a certain degree by the presence of phloroglucin, which with hydrochloric acid is Wiesner's (1878) test for lignin, a reddish violet color being the result. Pure coniferin gives only a faint reaction with the reagent. The cause of the intensity of the color in lignified tissue has not been determined. Vanillin always accompanies lignin; but Swedish filtering paper, soaked in a solution of coniferin, and after drying, moistened with a solution of gum or of vanillin, yielded with the reagent no color or only a faint one. Tannin, oil of turpentine and fresh vegetable extract did likewise not further the reaction.—Ber. D. Botan. Ges., 1886, 301-305; Amer. Jour. Phar., Febr. 1887, 74.

Balsams, Resins and Gum Resins—Volumetric Method of Examination.—Mr. A. Kremel describes a method for the volumetric determination of balsams, resins and gum resins, which is based upon the neutralization of the free acids contained in them on the one hand, and the decomposition and saponification of the ether compounds associated with them, on the other. He thus obtains comparative numbers which serve for the identification of the substance under examination. 1 gram of the substance is dissolved in neutral alcohol, a few drops of phenolphthaleïne solution are added, and the solution is titrated with alcoholic solution of potassa (½ normal) until a red color is developed. The quantity of alkali consumed is calculated for 1 gram of the substance in milligrams, and the number so ascertained designated the *acid number*. Those substances that contain also an ether compound (Bals. Tolu, Bals. Peru, Benzoin, etc.,) are, after this treatment, heated upon a water bath with an excess (20 to 30 cc.) of the alcoholic potash solution for 15 minutes, the excess of alkali is determined by titration with normal hydrochloric acid, and the quantity of alkali consumed, calculated as above, gives the *ether number*, the total alkali consumed being designated as the *saponification number*. In the case of the gum resins these are mixed with an indifferent body—preferably powdered gypsum—and extracted with 95 per cent. alcohol in an extraction apparatus. The residue of evaporation gives the percentage of resin, in which the acid, ether and saponification numbers are determined as in the above case. The author gives the results of the examination by this method of a large number of balsams, resins, etc., embracing nearly all that are at present in use.—Arch. d. Pharm., Oct. 1886, 853–856; from Pharm. Post.

Amber—Characters and Examination.—Mr. O. Helm has contributed a number of highly interesting articles on amber and allied fossil resins, which have appeared at different times in the Proceedings of the Natural History Society of Dantzic. The author has a collection of about 700 specimens of amber enclosing insects, besides others enclosing plant fragments. As a rule, the insects are different from those at present found on the Baltic coast, whilst these distinctions are even greater among those containing plant fragments, the latter belonging, for the greater part, to plants indigenous to the southern and tropical zone. Under the designation of Baltic amber the author émbraces the tertiary formation of the Prussian samland, the Baltic provinces of Russia to Jutland, and the coast of Holland. This so-called Baltic amber is characterized by a large percentage of succinic acid (from 3 to 8 per cent.), whilst Roumanian amber contains, as a rule, only small percentages. A fossil resin containing succinic acid is also found in Galicia, along with resin entirely devoid of the acid. The fossil resins found in Asia Minor, Sicily, Upper Italy, France and Spain, contain no succinic acid, but do contain other volatile organic acids, particularly formic acid. The author has also examined amber found by Schliemann in Mycena, and found this to have a composition practically identical with that of Baltic amber. He gives a method for the determination of the percentage of succinic acid in amber, which may be consulted in the abstract of the author's papers in Arch. d. Pharm., Oct. 1886, 860–861.

Kauri Resin—Value as a Deodorizer and Disinfectant.—According to Dr. B. W. Richardson, kauri resin is useful as a deodorizer and disinfectant, either combined with iodine or by burning it, when it gives out a very pleasant odor. Water mixed with the powdered resin and used as a spray in a room, is said to render the air ozonic.—Asclepiad, July 1886.

ALCOHOLS.

Brandy—Distillation from Wine Residues (*Grape-Marc*).—Mr. Rommier has made experiments on an extensive scale with a view to the improvement in the brandy distilled from wine-residues. He found that the unpleasant odor so often noticed in brandies from this source is due to the presence of certain fungi which are formed when there is a deficiency in the elliptically-formed yeast fungus, and that the formation of the former is readily obviated by the addition of the latter. He shows, furthermore, that the marc from white grapes contains considerable quantities of aromatic compounds, which yield the bouquet of brandies, and that therefore good products are obtainable if the grape-marc is fermented with the addition of sugar and yeast, and the fermented mixture subjected to distillation.—Arch. d. Pharm., Dec. 1886, 1033; from Jour. de Pharm. et de Chim., 1886, xiv, 378.

Ether—B. P. Test of Purity.—The present British Pharmacopœia directs that ether shaken with solution of potassium iodide and starch paste should produce little or no blue color. Prof. Dunstan and T. S. Dymond have investigated this test and found that ether prepared from sodium ethoxide and ethyl iodide, does not liberate iodine from potassium iodide, until after about three hours traces of it are set free; but hydriodic acid at once caused the liberation of iodine. Ether prepared from sulphuric acid and alcohol liberates iodine from strong solutions of potassium iodide, and very slowly from dilute solutions, the reaction being accelerated by the presence of acid. The reaction is not due to ozone, for on agitating the ether with mercury or silver the filtrate had the same behavior as before. On warming the ether with solution of sodium carbonate, neither the escaping gas nor the remaining ether had any effect upon potassium iodide. The presence of hydrogen peroxide, thus indicated, was shown by shaking the ether with a very dilute solution of potassium chromate acidulated with sulphuric acid, when the ether separated of a deep blue color, due to perchromic acid. Some commercial ethers, particularly if made from methylated spirit, contain an impurity which forms H_2O_2 after a short time, and this may then be detected by the perchromate test. The quantity of H_2O_2 amounted to only .04 per cent. determined from the iodine liberated. The impurity may be removed by treating the ether with excess of lime and washing the distillate with alkaline water.—Pharm. Jour. and Trans., April 16, 1887, 841.

Acetic Ether—Compound with Chloride of Magnesium.—According to Mr. Allain-le-Canu, acetic ether and chloride of magnesium unite to form a crystalline compound, which is obtained dry with difficulty. It is best obtained by dissolving the perfectly anhydrous salt in the ether. Its composition appears to be 4 mol. chloride of magnesium and 5 mol. acetic ether. —Arch. d. Pharm., July 1886, 602; from Jour. Pharm. Chim., 1886, 335.

Acetic Ether—Test for the Presence of Amyl-alcohol.—Mr. Werner has examined a specimen of acetic ether which left on evaporation a distinct odor of amyl-alcohol. To determine the presence of the latter a test tube is filled with the suspected ether to the height of 1–2 cm., and the same volume of sulphuric acid is allowed to flow into the tube slowly. A dark nearly black zone is formed at the point of contact, and the acid gradually assumes a violet color in the presence of fusel oil. If the ether is pure, it does not become colored, and leaves no odor on evaporation.—Arch. d. Pharm, April 1887, 308; Pharm. Ztg., 1887, 106.

Nitric Ethers—Production for Experimental Purposes by the Aid of Nitro-glycerin.—Mr. Bertoni communicates a relatively simple method for the production of small quantities of nitric ethers from different alcohols, which is particularly adapted for lecture experiments. He adds the calculated quantity of the alcohol to nitro-glycerin, contained in a strong glass tube, closed at one end, and cooled by ice water, agitates gently and carefully, thus producing an emulsion-like mixture, and then allows the mixture to stand. After a time two clear layers form, the lower being glycerin, the upper the desired nitric ether. The experiment is uniformly successful if the alcohol is soluble and the ether formed insoluble in water.—Annali di Chim. e Farm., 1886, 166; Arch. d. Pharm., July 1886, 636.

Nitrite of Ethyl—Preservation.—Mr. John Williams has made some experiments which seem to point out a possible method of preserving nitrite of ethyl from change by the intervention of glycerin. He has kept solutions containing 5, 10, and 16 per cent. of the ether respectively, unchanged for a short period of time. To prepare these solutions gaseous nitrite of ethyl is passed into a mixture of 1 part of pure glycerin and 2 parts of pure absolute alcohol. These solutions cannot be mixed with water, without loss by effervescence of a portion of the ether. It is necessary to dilute first with alcohol to at least 2½ per cent. ether, the strongest solution that will bear dilution without loss.—Yearbook of Phar., 1886, 514–515.

Commercial Chloroform—Presence of Arsenic in a Sample.—Mr. L. Scholvien notes the occurrence of arsenic in several samples of chloroform. To detect it, he recommends shaking with dilute potassa solution, evaporation of the alkaline solution, and determination in the residue by one of the known methods—most conveniently by Bettendorff's. If in testing for the presence of chlorine, *neutral* silver solution is employed, the presence of arsenic is easily determined.—Arch. d. Pharm., Feb. 1887, 129; from Apoth. Ztg., 1887, No. 3.

Iodoform and Bromoform—Preparation.—Mr. F. Günther has made very exhaustive studies of the methods employed for the preparation of iodoform and bromoform. The results of his experiments lead him to recommend alcohol containing from 20–25 per cent of aldehyde for the preparation of iodoform. The alcohol is mixed with 10 times its weight of solution of soda, the iodine is added, and a current of carbonic acid is passed through the mixture. The reaction takes place at the ordinary temperature, the mixture being stirred occasionally. The addition, in the beginning, of a little iodide of sodium is a possible advantage, since it dissolves iodine, and thus hastens the process. Iodide of sodium perfectly free from iodate of sodium is obtained as a by-product, all of the hypo-iodic acid preliminarily formed being consumed in the formation of iodoform from the aldehyde. The introduction of carbonic acid has for its purposes the liberation of the hypo-iodic acid from the hypoiodate formed by the union of the iodine with the alkali. For the preparation of bromoform acetone is the most suitable material. This is mixed with soda solution and bromine at 50°, the condition of the reaction being in other respects the same as in the case of iodoform. The crude bromoform is dehydrated with chloride of calcium, shaken with conc. sulphuric acid, and distilled in a current of carbonic acid.—Arch. d. Pharm., May 1887, 373–394.

Iodoform—Volatility.—Dr. Vulpius having called in question Mr. D. B. Dott's statement (see Proceedings 1886, 553) that under certain circumstances iodoform loses by volatility at the rate of 6.7 per cent. per hour, when placed in a water-bath, the latter has repeated his experiments and finds his former statement to be correct. In his last experiments he found the loss in weight to be on an average 6.68 per cent. of the weight of iodoform exposed.—Yearbook of Pharm., 1886, 554–555.

Iodoform—Causes of Decomposition in Ether-Solution.—Respecting the causes of the decomposition of iodoform in solution in ether, various opinions have been advanced. The results of comprehensive experiments made by Mr. E. Fischer lead him to the following conclusions: Iodoform dissolved in pure ether is not decomposed by the influence of light. Ordinary ether causes the decomposition of iodoform in consequence of impurities which are removable by the treatment of the ether with potassium hydrate. These impurities are formed again in a short time by the influence of atmospheric air. The decomposition of iodoform is retarded but not prevented by the exclusion of light. It seems probable that, in accordance with the opinion expressed by Boerrigter, the impurity in ether causing the decomposition of iodoform is peroxide of hydrogen.—Arch. d. Pharm., June 1887, 494–495; from Pharm. Ztg., **32**, 149.

Iodoform—Examination of Commercial Samples.—Mr. J. R. Conrad has examined seven American and one European samples of iodoform. Only one of the samples (of American make) left a slight solid residue on ignition; the percentage of absolute iodoform in this case being 96 31. The others contained the following percentages respectively: 97.39, 98.73; 98.02; 97.89; 98.33; 98.56, and 98.41. All when treated with water were neutral to litmus. The filtrate from each gave a very slight turbidity with nitrate of silver, but none with barium chloride, and the absence of picric acid in all of the samples was proven by the proper tests. Addition of alcoholic solution of nitrate of silver and exposure for 24 hours, resulted in the production of reduced silver in three samples, evidence of presence of impurities of a toxic nature according to Dr. Brouma.—Phar. Era, March 1887, 68–69; from Proc. Mich. Phar. Assoc., 1886.

Iodoform—Incompatibility with *Calomel,* which see under "Inorganic Chemistry."

Iodoform—Inefficiency as an Antiseptic.—Messrs. Ch. Heyn and T. Rosving record a series of experiments on animals which lead them to conclude:

(1) That iodoform is valueless in surgery as an antiseptic, even though it may possess other useful properties.

(2) That as iodoform preparations themselves may contain pathogenous micro-organisms, they cannot be used without some danger.

(3) That even though iodoform be pure there is danger in using it, unless care be taken that the apparatus (brushes, sprays, etc.) by which it is applied are free from infective germs, for the iodoform will not kill these. In support of this view they bring forward a case recorded by Lesser, where a brush, with which a soft sore had been painted with iodoform, was applied next day to dust with iodoform a granulating wound, and a soft sore formed on the wound in consequence.

In a recent number of the *Wien. med. Woch.*, the paper of Heyn and Rosving is subjected to criticism which is unnecesarily abusive. The conclusion arrived at as to the uselessnes and even danger of iodoform dressing may not be fully warranted by the results of their experiments, but they have done good service by drawing attention to the subject.—Med. Chronicle, March 1887; from Fortsch. d. Med., Jan. 16, 1887.

Chloral—Forensic Determination.—Prof. G. Dragendorff, having previously shown that chloral hydrate may be abstracted from aqueous solutions by agitation with ether and acetic ether, recommends, based upon the researches of Baron Tiesenhausen, the treatment of urine first with petroleum-benzin, then with ether, when on evaporation of the latter solvent, the chloral hydrate is left behind. Other organic mixtures, such as the contents of the stomach, require to be acidulated with diluted sulphuric acid, and macerated for a day with 3 volumes of strong alcohol; the filtrate is evaporated spontaneously until the alcohol has been volatilzed, when the aqueous residue will yield fat, etc., to petroleum-benzin, and subsequently chloral hydrate to ether. Blood and organs containing much blood retain the chloral within the coagulum, in which it is best recognized by the production of chloroform on distilling with sodium hydrate. 0.005 gm. chloral hydrate may, by these processes, be readily recognized in from 75 to 100 ccm. of mixture.

The most suitable reactions for the recognition of chloral hydrate are the following:

The dry chloral hydrate is warmed with alcoholic soda solution and a little pure aniline; the odor of isonitril is still distinct, though faint, with $\frac{1}{600000}$ gm. of chloral hydrate.

Heat to 50°C. the hydrate with 1 or 2 drops of concentrated aqueous potassa solution, and a little naphthol; the blue color produced also with chloroform, is recognized with $\frac{1}{24000}$ gm. of chloral hydrate.

Experiments with animals show that chloral hydrate is rapidly resorbed and transformed into products which, like urochloralic acid, do not show the reactions of chloral hydrate.—Amer. Jour. Phar., Dec. 1886, 594-595; from Phar. Zeitsch. f. Russl., 1886.

Paraldehyde—Value as a Hypnotic.—Dr. S. G. Webber observes that paraldehyde has some advantages over chloral. The immediate subsequent effects are less unpleasant. It very rarely causes headache on the next day; sometimes patients have a sensation of fulness or pressure in the head for a few hours after waking. He gave it in one case where the patient had been taking chloral in large doses, not measuring the dose, and had been injuriously affected by the drug. The paraldehyde gave, in this instance, better and more prolonged rest; the patient partially recovered his mental powers and some measure of strength. The paraldehyde was continued several weeks in nightly doses of forty minims. In this patient there was probably disseminated sclerosis, and it did not seem possible to do without some agent to produce sleep, at least so long as he was at home. The chief objection to paraldehyde is its disagreeable odor and taste, and also the odor it imparts to the breath. He does not remember to have met any unpleasant symptoms arising from its use; but had never seen a case in which it had been used habitually for a long time. The dose is from forty-eight to eighty or ninety minims; sixty minims is the average dose. Occasionally a dose of eighty minims has failed to give the sleep which he desired to obtain.—Boston Med. and Surg. Jour., Oct. 14, 1886.

Formaldehyde—Conversion into Formose.—In his experiments resulting in the production of a sugar—*formose*—(see Proceedings 1886) from formaldehyde, Mr. O. Loew had employed hydrate of lime for the conversion of the latter into formose. The author now finds that this conversion is possible from simple aqueous solution. If a 0.5 % solution of formaldehyde is boiled for 12 to 15 hours with granulated zinc in a flask provided with a return-cooler, and the liquid is evaporated, an optically inactive sugar, having a pure and intensely sweet taste, is produced, which does not ferment with beer-yeast and resembles formose very closely.—Arch. d. Pharm., Sept. 1886, 803; from Jour. f. prakt. Chem., 34, 51.

Urethane—Determination.—Mr. Jacquemin has devised a method for the determination of urethane (ethylcarbamate) which is dependent upon the fact that, while urethane is not decomposed by any single salt of whatever kind, it is decomposed in the presence of both a silver or mercury salt and potassa. Alcohol is liberated, carbamate of potassium is formed, and this forms, with the metallic salts named, double salts, which are precipitated. The method is tolerably sensitive, 1.5 gram per liter being readily detected. Experiments made to establish a volumetric method have shown that 0.1 gram urethane, dissolved in 10 cc. of water, in presence of a decided excess of solution of potassa, requires just 20 cc. of a solution of corrosive sublimate containing 1.522 in 100 cc. for complete decomposition. A white precipitate is formed as long as urethane is present. When this has been completely decomposed, mercuric oxide is precipitated by the excess of potassa in the liquid, and is evidenced by its yellow color.—Arch. d. Pharm., Nov. 1886, 937; from Jour. de Pharm. et de Chim., xiv, 177.

Urethane—Experience in its Administration.—Dr. Lagowoï finds urethane to be very useful in insomnia arising from nervous excitability, but it is less pronounced in its effects where there is local pain. It is indicated in delirium tremens, and some forms of mania and melancholia; also to combat the cerebral phenomena of typhoid. The dose varies between 1.0 and 4.0. Urethane augments the number of respirations, but has no action on the pulse and temperature. The sleep produced is tranquil, and is followed by no disagreeable sensations.—Bull. Gén. de Thérap., May 30, 187.

Urethane—Value as an Antidote to Strychnine, Picrotoxin and Resorcin. Prof. Aurep has experimented on animals with urethane, and found it to be antagonistic to and a counter-poison for strychnine, picrotoxin and resorcin. Urethane is equally as good as chloral, and is not dangerous, as large doses can be taken without affecting the circulation or respiration. To judge from the effect on dogs, it would require from 8 to 12 grams of urethane to overcome strychnine poisoning in a human being. —Ph. Post, xix, 726; Amer. Jour. Phar., 1887, 129.

Urethane—Value as a Hypnotic.—Dr. S. G. Webber states that urethane is more pleasant to administer than paraldehyde (which see), having scarcely any taste or odor. When he first gave it the dose was too small, but by increasing it to thirty grains good results were generally obtained. Sometimes much larger doses are necessary. It is quite soluble; 15 grains will dissolve in a drachm of water. The after-effects are generally unimportant. It has seemed once or twice to give rise to nausea the day after; but often the patient says the sleep has been very natural and refreshing. It is not so sure to produce sleep as paraldehyde.—Boston Med. and Surg. Jour., Oct. 14, 1886.

Butyl chloral Hydrate—Examination of Commercial Specimens.—Mr. J. J. Thomas, after giving the history, method of preparation and character of butyl-chloral hydrate, records some experiments made to determine the melting and congealing point, as well as other characters necessary to establish the quality of commercial samples. He found in the course of these experiments that by heating the butyl-chloral hydrate at 100°, dissociation occurs, and water of hydration escapes, which must be replaced before the compound will again solidify. The dissociation also interfered to some extent with the determination of the melting and congealing points of the compound. The following table gives the result of the author's examination of five samples, the first (No. 1) being butyl-chloral hydrate prepared by him :

	Fusing Point.	Solidifying Point.	Yielded Chloroform with KOH.	Test-paper.
No. 1 . .	77° C.	68.5° C.	None.	Very slightly acid.
No. 2 . .	78° C.	69.5° C.	Distinct.	Slightly acid.
No. 3 . .	79.5° C.	68.5° C.	None.	Neutral.
No. 4 . .	77° C.	64° C.	None.	Slightly acid.
No. 5 . .	79° C.	66° C.	None.	Neutral.
B. P. . .	77° C.	71.1° C.	None.	Neutral or slightly acid.

The experiments to determine chloroform were made because of the liability of the butyl-chloral hydrate to contain ordinary chloral hydrate. —Pharm. Jour. and Trans., May 28, 1887, 986–987.

Hypnone—Hypnotic Value.—Dr. C. G. Webber observes that this compound has a bitter almond odor. He has given it in capsules in doses of five to eight drops, or even more ; the former dose is rather small for good results. It will produce very natural sleep, and the patient awakes refreshed. It is of much less value than some other hypnotics recently introduced and fails more frequently in producing sleep. It may be conveniently substituted for paraldehyde, urethane, or hydrobromate of hyoscine (see these) when they have been taken some time consecutively. —Boston Med. and Surg. Jour., Oct. 14, 1886.

Amyl Acetate—Use as a Solvent for Gun Cotton.—Prof. Henry Trimble draws attention to the fact that amyl acetate has recently come into use for manufacturing purposes without attracting any scientific attention. Its value depends on the excellent solvent power for pyroxylin which it possesses. Good soluble gun cotton will dissolve in it until a jelly is formed and the vessel may be inverted. On this account it has become valuable to the manufacturer of celluloid, and to the manufacturer of certain kinds of lacquer for coating brass and copper. These two industries are consuming enormous quantities of this solvent, and the probabilities are that the use of it has not fairly commenced.—Amer. Jour. Pharm., June 1887, 275.

Nitrite of Amyl—Value in Opium Narcosis.—L'Union Médicale reports a case of opium poisoning, in which the inhalations of nitrite of amyl brought on a rapid cure, when belladonna had failed, and the patient was almost beyond help.—Med. News, Oct. 2, 1886.

Wood-Naphtha—Characters and Method of Purifying the Crude Product.—Mr. C. A. Fawcett discusses the conditions on which the yield of the different products of wood distillation depends, and refers particularly to the preparation, properties, and uses of wood-naphtha. The crude naphtha has a sp. gr. varying from 0.970 to 0.990. It has a dark brown color and strong odor. Besides water, it contains methyl alcohol, acetone, methyl acetate, aldehyde, allyl alcohol, dimethyl ethylidene ether, also small quantities of mono-, di-, and tri-methylamine, ammonium acetate, oils, and tarry matter. As to methods in use for working up the crude naphtha, that involving distillation by means of lime gives the best product. The lime retains the water and acid, almost entirely decomposes the methyl acetate and simple and compound ammonias, converts the greater part of the oils into solid resinous bodies of high boiling points, and diminishes the percentage of acetone, which, on treatment with lime, gives condensation products of high boiling point. In conclusion, the author refers to the composition of the oils present in the crude naphtha. —J. Chem. Soc., 1886, p. 289; J. Soc. Chem. Ind., iv, 319.

Methyl Alcohol—Detection in Admixture with Ethyl Alcohol.—Mr. C. W. Parsons draws attention to the introduction of wood alcohol in admixture with ethyl alcohol, and the recommendation of its use for the preparation of medicinal extracts as well as for technical purposes. The mixture is sold under the trade-name of

Alcholene; but, to judge from the author's experimental results, this is not uniform in composition, though the sp. gr. may be the same. One sample contained approximately 31 per cent. methyl and 58 per cent. ethyl alcohol, the remainder being calculated as water. Another sample gave 76 per cent. methyl and 13 per cent. ethyl alcohol. Alcholene is a colorless, limpid, inflammable liquid, having a very strong odor of methyl alcohol. The sample examined by Prof. Parsons had the sp. gr. 0.8259 at 15° C., boiled at 74.8°, and gave a slight acid reaction to litmus. In order to establish a method for the

Estimation of Methyl Alcohol in Fluid Extracts and Tinctures, the author prepared some of these, using known proportions of ethyl and methyl alcohol, either alone or in mixture, as solvents and menstrua, in order to determine a method for the detection of methyl alcohol in such preparations. It was found that the two alcohols could be very fairly separated and identified in all proportions down to a minimum proportion of 5 per cent. of either alcohol, the limit of error being about 2 per cent. in either direction.

The following tests were employed: Pure methyl alcohol boils at 66° C., ethyl alcohol at 76C. Careful and long distillation at a temperature between 65° and 74° C. affords the best method of separation of methyl alcohol, after which the temperature is maintained at 76° C. or above, until all the ethyl alcohol is distilled. A mixture of equal volumes of methyl alcohol and pure sulphuric acid produces a dark-brown color, ethyl alcohol giving no discoloration. It is well, therefore, to collect the distillates in small portions, testing each until no color is produced by sulphuric acid. This test was found to give excellent results in nearly all cases. In examining fluid extract of buchu, however, this test was of no value. A volatile, odorous principle was present, which always produced with the acid a slight brown color. In such cases fractional distillation with careful regulation of temperature must be greatly relied upon. Other tests of identification will readily suggest themselves to the practical worker.—Drugg. Circ., Dec. 1886, 267–268.

Methyl Alcohol—Identification in Presence of Ethyl Alcohol.—Mr. Wm. Rupp has also had occasion to examine the commercial mixture of methyl- and ethyl-alcohol called "alcholine," and obtained essentially the same results as Prof. Parsons. The most satisfactory results for the distinction of the two alcohols were obtained by the method which was first proposed by Riche and Bordy, which is as follows: Four cc. of the alcohol are placed in a flask, and 6 cc. of concentrated sulphuric acid are carefully added, and then 10 cc. of water. Then 7 or 8 cc. are distilled off into a graduated flask. To this distillate are added 5 cc. sulphuric acid of specific gravity 1.172 and 10 cc. potassium permanganate of specific gravity 1.029. After several minutes the brown liquid is decolorized with 4 cc. of sodium thiosulphate of specific gravity 1.29; and 4 cc. of a solution of magenta containing 0.02 grm. per litre are added. If ethyl alcohol is present, the liquid assumes a violet color. The same authors have also devised the following method for the detection of methyl alcohol in ethyl alcohol, the process being sufficiently delicate to show the presence of 1 per cent. of the former. It depends on the formation of methyl aniline violet. Ten cc. of the alcohol, previously distilled over potassium carbonate, are placed in a small flask with 15 grms. iodine and 2 grms. red phosphorus. The methyl and ethyl iodides formed are distilled off into water. The heavy, oily liquid is separated from the water and added to 5 cc. aniline in a flask. After one hour the product is boiled with water, and solution of soda added, and the oily base rising to the surface is removed by means of a pipette. One cc. of the oily liquid is then oxidized by thoroughly mixing with 10 grms. of a mixture of 100 parts clean sand, 2 parts sodium chloride, and 3 parts cupric nitrate, and heating in a glass tube for 10 hours to 90° C. The product is exhausted with warm alcohol, and if the alcohol under examination contained methyl alcohol, a violet solution is obtained.—Ibid., Jan. 1887, 4.

Methyl Alcohol—Compound with Sulphate of Copper.—According to Mr. de Forcand a definite crystalline compound of sulphate of copper and methyl alcohol is produced when the anhydrous copper salt is allowed to react on the alcohol. The mixture rapidly assumes a green color and a crystalline compound is formed, which may be separated by filtration and subsequent draining on a porous plate. The new compound is composed of one equivalent each of methyl alcohol and cupric sulphate.—Arch. d. Pharm., July 1886, 637; from Jour. Pharm. Chim., 1886, 485.

Methylal—Characters and Value as a Hypnotic.—Personali has subjected methylal, introduced by him recently as a hypnotic, to comprehensive study. The compound, which is synonymous with

Dimethylaldehyde and Formo-dimethyladelhyde, has the composition $C_3H_8O_2$, and was first prepared in 1839 by Malaguti by treating the product of the distillation of methyl alcohol, peroxide manganese and sulphuric acid, with potassium hydrate. It may be regarded as *formene*, in which two atoms of hydrogen are replaced by two molecules of methyloxide. Methylal constitutes a very mobile, colorless liquid, which faintly reddens litmus, and is very volatile, producing a non-inflammable vapor. Its odor is that of acetic ether and chloroform combined; its taste burning and aromatic; its sp. gr. 0.8551, and its boiling point near 42°. It is readily soluble in water, alcohol, and the fixed and isolated oils. Used as a hypnotic it produces quiet and profound sleep, without unpleasant after-effects; but the effect passes off rapidly. The heart-beats are somewhat increased, the blood-pressure somewhat diminished, the respiration less frequent and deeper. Externally it is used as liniment with almond oil (1:6); internally in the form of mixture or syrup, containing 1 p. in 150, or 1.5 in 100 respectively.—Jour. de Phar. et de Chim., 1887, xv., 33.

Methylal—Character and Medicinal Uses.—Dr. B. W. Richardson, who first called attention to the value of methylal as an hypnotic and anæsthetic in 1868 and 1869 (Rep. Brit. Assoc. for the Advancement of Science, Vols. XXVIII and XXIX), now records the results of his observations since then. From his experience with the pure article, methylal lies between alcohol and anhydrous ether. It quickens the action of the heart with reduction of arterial pressure; it makes the respiration slow and deep; it induces a tendency to sleep; and it is a sedative to pain, but not to a very great degree. On the whole it would be best to keep it in the group of anodyne antispasmodics. It causes very little muscular excitement and no vomiting, but after long inhalation of its vapor produces a free flow of saliva. As it mixes well with alcohol and with ether it might be administered with either of these agents; and it might also be given with amyl nitrite for the relief of colic, asthma, angina pectoris or tetanus; but before it can come into general use it must be reduced in price. It is made by distilling methylic alcohol with sulphuric acid in the presence of peroxide of manganese, but it requires several re-distillations before it can be obtained in the pure state, for which reason it is at present a very expensive compound.

Methylal is a colorless fluid of specific gravity 0.855; its vapor density is 38°, taking hydrogen as unity; and boiling point of 42° Cent.=107.6° Fahr. Its solubility in blood is one part in three; its composition is $C_3H_8O_2$. When quite pure it is almost tasteless, but bites the tongue, and owing to its low boiling point quickly evaporates. The odor of it is fragrant and not very powerful. The pure vapor creates no irritation on being breathed. Being quite soluble in water, it may be given internally in admixture with glycerin or syrup of orange flowers, the following being one of the prescriptions employed by the author:

Methylal (pure)	ʒ vi.
Syrup of orange flowers	ʒ iv.
Distilled water	ad ℥ vi. M.

The dose is 1 to 2 fluidounces, to be taken in a wineglassful of water, and may be increased to twice this quantity or more.—Asclepiad, No. 13; Pharm. Jour. and Trans., Feb. 13, 1887.

Phtalic Alcohol—Production of Phtalic Anhydride.—Mr. Edw. Hjelt has obtained by the action of sulphuric acid upon phtalic alcohol ($C_8H_{10}O_2$) an anhydride in the form of a fine yellowish powder, which is completely insoluble in water, alcohol, ether, chloroform, benzol, etc. The compound has the empirical formula C_8H_8O, and is very resistant to oxidizing agents, being very slowly oxidized by a mixture of sulphuric and chromic acids, an acid being formed which melts at a high temperature.—Arch. d. Pharm., Aug. 1886, 716; Ber. d. D. Chem. Ges., xix, 1538.

Phenol—Forensic Determination.—Experiments were made by Dr. Waldemar Jacobson for the purpose of isolating and recognizing phenol. The organic mixtures, 100 ccm., were macerated for a day with 400 ccm. of alcohol, the filtrate was freed from alcohol by distillation at a low temperature and under reduced pressure, the aqueous residue filtered, agitated with little petroleum benzin for the separation of fat, and then repeatedly shaken with benzol, which solvent was evaporated in watch-glasses. The following reactions were employed:

Dragendorff's method: The residue was left in contact at ordinary temperatures with solution of mercuric nitrate, containing a little nitrous acid; the red color appears in half an hour with 1 phenol in 100,000 mixture.

Jacquemin's method: Dissolve 3 drops of colorless aniline in 50 ccm. of water. Dilute 5 or 10 drops of this solution with 5 ccm. of water, and add sufficient solution of sodium hypochlorite (1 sodium carbonate; 1 chlorinated lime; 10 water; filter), until a distinct violet or brown color is produced. Add of this freshly prepared mixture to the phenol, previously mixed with ammonia until the liquid is colored violet or brownish, when in a short time in the presence of phenol (1:50,000) the color will change to blue, or with less phenol (1:100,000) to green.

Landolt's reaction: Cloëtta and Schær have shown that the crystalline precipitate with bromine is still obtained in solutions of phenol diluted to the proportion 1:100,000. In separating small quantities of phenol from animal matter, Jacobson obtained amorphous precipitates with bromine, which, after drying, dissolving in alcohol and evaporating slowly, yielded the characteristic groups of needles. Minute quantities of phenol are best dissolved in little water, and then exposed to bromine vapors.—Amer. Jour. Phar., Dec. 1886, 595; from Phar. Zeitschr f. Russl., 1886.

Carbolic Acid—Determination as Tribromphenol.—Mr. H. Beckurts records the details of extended experiments made with a view to determine the applicability of the method, originally proposed by Landolt, which is based on the formation of insoluble tribromphenol when carbolic acid is treated with bromine water in excess. The author finds that the method, under certain modifications, is applicable in all cases in which watery solutions of *pure* carbolic acid are concerned, or in the case of mixtures of pure carbolic acid with other substances from which it may be easily separated in a pure state, either by distillation or extraction. Such are the officinal liquid carbolic acid (Phar. Germ.), aqua carbolisat., bandaging materials, and cases of poisoning. The method is inapplicable for the determination of carbolic acid in the presence of other phenols, and particularly of cresols, and is therefore useless in the case of the crude acid. The author finds that when bromine water is used, the results are inaccurate, since instead of tribromphenol, tribromphenol-bromine is mainly formed. He finds the method of Koppeschaar most suitable, using the solution of bromide and bromate of potassium recommended by Seubert. The bromide solution is $\frac{1}{100}$ normal (5.939 KBr per litre), and the bromate solution is $\frac{1}{500}$ normal (1.6666 $KBrO_3$ per litre). A $\frac{1}{10}$ normal hyposulphite of sodium solution, and a solution of iodide of potassium containing 125 grams KI per litre are also necessary. The method is carried out by the author as follows: Into a flask provided with a well-fitting glass stopper 25–35 cc. of the phenol solution (1 : 1000) are placed, followed by 50 cc. each of the bromide and bromate solutions and 5 cc. of concentrated sulphuric acid, and the contents are vigorously shaken. No change is observed at first, but after a time the liquid becomes opalescent, tribromphenol and tribromphenol-bromine are separated, and a yellow color is developed by the separation of the excess of bromine. After 10 to 15 minutes, the reaction being concluded, 10 cc. of the iodide of potassium solution are added, and the separated iodine is titrated with the $\frac{1}{10}$ N. hyposulphite solution. The amount of phenol is determined by calculation from the following data:

The sulphuric acid liberates from the 50 cc. of bromide and bromate solution 0.2392 Br., which is capable of uniting with 0.0469 of phenol. 1 cc. of $\frac{1}{10}$ N. hyposulphite solution corresponds to a quantity of iodine equal to 0.008 Br., or 0.00156 phenol. By multiplying this last sum by the number of cc. of hyposulphite solution used in the titration, and subtracting from 0.0469 (the amount of phenol equal to the entire amount of bromine liberated in the experiment) the amount of phenol in the quantity of solution employed is at once determined.—Arch. d. Pharm., July 1886, 561–572.

Carbolic Acid—Cause of Reddening.—To the numerous explanations that have been given from time to time as to the cause of reddening of pure carbolic acid, Mr. E. Mylius adds another. His experiments lead him to the conclusion that it is caused by the alkali of the glass vessels in which the carbolic acid is contained. A portion of the alkali being dissolved, it occasions the oxidation of the phenol and thus gives rise to the red color.—Arch. d. Pharm., 1887, 308; from Pharm. Centralh., 1887, 72.

Carbolic Acid—Removal of Red Color.—According to Mr. S. Demant the red color of carbolic acid may be removed by adding to 89 p. of melted acid, 11 p. of alcohol, subjecting the mixture to freezing, and then draining off the portion remaining liquid. Perfectly white crystals of carbolic acid are thus obtained.—Arch. d. Pharm., May 1887, 405; from Zeitschr. d. Oest. Apoth. Ver., No. 9.

Carbolic Acid.—Property to prevent the luminosity of *Phosphorus*, which see under "Inorganic Chemistry."

Phenol.—New compound with *Urea=Phenol-urea*, which see under "Organic Bases."

Carbolic Acid.—A new compound with salicylic acid. See *Salol*, under "Organic Acids."

Boro-phenol—Use and Value as a Disinfectant.—Respecting this new disinfectant and antiseptic, which is a combination of borax and carbolic acid, it is remarked in "Quart. Therap. Rev." (1887, 3) that it has an odor which is really agreeable. This in itself is an immense advance on the old-fashioned carbolic acid preparations. It is found, also, that it is completely soluble in water, and that it forms a solution which may be used for all the purposes for which the ordinary carbolic acid disinfectants are applicable. The new combination has, however, to be used in very much smaller quantities than the carbolic acid disinfecting powder.

Phenol-Mercury (*Hydrarygrum Carbolicum Oxydatum*)—*Preparation and Uses.*—According to Mr. K. Schadeck this compound, which is regarded as valuable in the treatment of syphilis, is prepared by mixing a dilute solution of 271 parts of corrosive sublimate with a concentrated solution of 132 parts of phenate of potassium. A reddish-orange precipitate is formed, which is washed on a filter as long as the washings give a reaction for chlorine. When dry the compound has a yellowish-white color, and is said to have a composition corresponding to the formula $(C_6H_5O)_2,Hg + H_2O$. It is given internally in form of pills, each containing 0.02 gram.—Arch. d. Phar., May 1887, 405; from Pharm. Centralh.

Trichlorphenol—Preparation and Uses.—Trichlorphenol is said to have been used in Germany as a very effective remedy in epidemic erysipelas. Its composition is $C_6H_2Cl_3OH$, and it is the chief product of the action of the chlorine upon phenol. It melts at 68° C. (154.4° F.) and boils at 244° C. (471.2° F.). On studying the action of alkali hypochlorites upon phenol, Th. Chandelon observed (*Berichte D. Chem. Ges.* 1883, p. 1749–1753) that orthochlorphenol is first produced; that on prolonging the action two dichlorphenols are formed, the *ortho ortho* and in larger quantity the *ortho-para* compound; and that finally the action results in the formation of *o-o p*-trichlorphenol. This reaction was previously described by W. Dianin (*Ibid*, 1880, p. 2403; see also Proceedings 1884, 268); at the end of the reaction the chlorophenols exist as calcium compounds, from which they are liberated by hydrochloric acid, and may then be separated by distillation with steam. Dianin stated also that trichlorphenol checks fermentation more energetically than carbolic acid, and that for this reason a mixture of phenol and chlorinated lime is far superior for the dressing of suppurating wounds than a solution of either one of these substances. For the extemporaneous preparation of trichlorphenol, Prof. Bartholow recommends (Coll. and Clin. Rec., 1886, 216,) mixing and then filtering one part of a 4 per cent. solution of carbolic acid and five parts saturated solution of chlorinated lime. Obviously, the liquid contains the new compound in combination with calcium.—Amer. Jour. Pharm., Dec. 1886, 598.

Phenylhydrazin—A New Reagent for Glucose.—Mr. Emil Fischer finds phenylhydrazin to be a characteristic reagent for glucose, being a universal reagent for aldehydes and ketones to which the glucose is closely related. A description of the compound, the method of its preparation and its application as a reagent, will be found in Amer. Drugg., Aug. 1886, 144–145.

Carbolic Acid and Cresols—Analgetic Action.—Dr. McNeill has made some experiments on himself and others with carbolic acid and the cresols, to determine whether their local anæsthetic influence can be utilized.

He finds that a mixture of sixty parts of acid and forty of oil renders the skin of the arm insensitive to pain caused by superficial incisions. It produces, however, a sensation of heat, but this can be removed without any interference with the anæsthesia by the application of glycerin. A mixture of glycerin and acid will have the same effect as the oil and acid, but only if twenty per cent. stronger. Impure carbolic acid having appeared more effective as a local anæsthetic than the absolute phenol, Dr. McNeill tried the effect of several of the substances allied to carbolic acid, which are produced in the distillation of coal. Several of these, as benzol and toluol, had no effect. A mixture of ortho- and paracresol (sold as cresolene) was found to have a similar effect to carbolic acid, but was not so powerful. Paracresol, on the other hand, acted more powerfully, equal parts of this substance and oil producing anæsthesia. It is worthy of note that whilst analgesia is produced the sensation of touch remains, and that the deeper parts may be opened painlessly by introducing some of the anæsthetic compound into the tissue laid open.—Amer. Jour. Pharm., Oct. 1886, 496; from Med. Chronicle, July, 1886.

Creasote—Commercial Quality.—Of fifteen samples of commercial creasote examined by Mr. Foster B. Eisenhart, seven were found to be pure, since they did not coagulate collodion, produced with ferric chloride a violet blue color rapidly changing to brown, and under the influence of bromine water gave a more or less deep-red brown color, but not a white precipitate. The other eight samples consisted of carbolic acid.—Amer. Jour. Pharm., Dec. 1886, 593.

Resorcin and Pyrocatechin—Detection in the Animal Economy.—From the experiments of Dr. Joseph Schomacker, the following conclusions may be summarized. Both substances given per os or subcutaneously in even relatively small doses may be detected, by Dragendorff's method, in the urine and in the different organs. They appear in the urine as sulpho-acids, which on boiling with HCl or H_2SO_4 are decomposed, liberating resorcin or pyrocatechin; after taking it in large doses, the former is found in the urine also in the free state. The excretion with the urine is completed in about seven hours for resorcin, and in about five hours for pyrocatechin; neither of the two compounds has been found in the fæces. Both are best isolated by means of acetic ether, and the most characteristic reagents are chlorinated lime for resorcin and ferric chloride for pyrocatechin.

The reactions and their limits were ascertained as follows:

Resorcin. .001 gm. with ferric chloride fine violet color, not observable with .0005 gm. Diluted solution of chlorinated lime gives with .00005 gm. a faint reaction, and with .0001 gm. a distinct violet color, gradually becoming yellow; on the careful addition of the reagent these colors may be repeatedly observed, and it is, therefore, best added drop by drop. Froehde's reagent produces after some time a violet color with .0005 gm. Sulpho-vanadic acid (1 ammonium vanadate to 100 sulphuric monohydrate) turns blue changing to violet; this change is not very plain with .00005 gm.

Pyrocatechin. .0001 gm. with ferric chloride becomes green, and then, on addition of ammonia, cherry red, blue and violet. Chlorinated lime turns blue-green. Froehde's reagent with .00005 gm. a green color, and with .005 gm. a blue-green color mixed with violet and blue streaks. Sulphovanadic acid with .0001 gm. a blue-green color; or in the presence of sulphuric bihydrate a green color.—Thesis, Dorpat, 1886. Am. J. Ph.

Glycerin.—Advantageous addition to *Solution of Chlorinated Soda*, which see under "Pharmacy."

Glycerin.—Relative quantity present in *Old Wines*, which see under "Materia Medica."

Glycerin.—Determination in Wines.—Mr. L. Legler communicates a method for the determination of glycerin in wines, which is dependent upon the separation of crude glycerin in the usual manner, and in this crude glycerin the pure substance as carbonic acid, using a Will's apparatus. For the details of the method reference must be had to the author's paper in Rep. d. Anal. Chem., 86, 631–636.

Glycerylborate ($C_3H_5BO_3$)—*A Definite Compound.*—Mr. James proposes the name of "Glycerylborate" for the compound commonly known as boroglyceride, and which has been by many regarded as a "mere mechanical mixture" of glycerin and boric acid, wherein the glycerin is rendered anhydrous by the process of heating, has solidified on being saturated with boric acid and allowed to cool. To determine whether these two substances actually combined and produced a new compound, or whether the substance obtained was merely a mixture of glycerin and boric acid, the amount of water eliminated suggested itself as an index to the character of reaction occurring on admixture of these substances under the influence of an elevated temperature.

For the experiment, one-half the molecular weight (expressed in grams) of the substances was used, viz., 46 grams of glycerin (anhydrous) and 31 grams of boric acid (pure) were introduced into a tarred retort, placed on a sand-bath, and connected with a tarred receiver immersed in cold water; a thermometer inserted through the tubulure of retort, and heat applied, due precautions being used to insure as perfect condensation of vapor as possible.

The temperature was gradually raised to 300° F., and maintained between 280° and 300° F., until the vapor of water was no longer evolved. The receiver, on being weighed, was found to contain 21.6 grams; the retort counterpoised, the weight of contents was found to be 53 grams; the weight of substances introduced, 77 grams. The weight of compound in retort plus weight of water condensed—viz: 53 grams + 21.6 grams = 74.6 grams, and the difference between 77 grams and 74.6 grams = 2.4 grams, gives us the amount of water lost by imperfect condensation; if this be added to the amount condensed, 21.6 grams + 2.4 grams, we have obtained 24 grams of water, which amount we find by calculation approximates 3 molecules; 27 grams being the exact weight of 3 molecules of water, the reactions occurring, no doubt, as follows: $C_3H_5(OH)_3 + H_3BO_3 = C_3H_5BO_3 + 3H_2O$. The amount of the compound obtainable from the proportions used is, according to the equation, 50 grams; but as we have seen in the experiment, our retort contained 53 grams, just 3 grams in excess of theoretical quantity, an amount which is the exact equivalent of water unaccounted for; and as some water adhered to cool portion of retort, the excess represents the amount of adherent water; hence, the total amount of water eliminated is 27 grams, or exactly 3 molecules. Several experiments were made, varying the quantities of the ingredients, but in no case did they prove successful if molecular quantities were deviated from; even when molecular quantities were used, if the theoretical amount of water was not eliminated, the product varied from a soft, opaque mass to a viscid liquid, semi-solid, glairy, or tenacious mass, according to the amount of borate formed. The compound is soluble in glycerin, which is no doubt the best solvent and vehicle for use; it is also soluble in alcohol, but is decomposed by water into boric acid (which separates if too much water is not added) and glycerin (remains in solution), according to following equation: $C_3H_5BO_3 + 3H_2O = C_3H_5(OH)_3 + H_3BO_3$. There is no doubt that this substance is a "definite chemical compound," in which the radicle of a triatomic alcohol has replaced the hydrogen of the acid, which at the moment of liberation becomes united to hydroxyl, producing water—a reaction analogous to the combination of metallic hydrates with acids. In producing this compound, 3 molecules of water are eliminated, which amount, if presented to the compound at ordinary temperature, resolves into its original constituents. If the pure compound be dissolved in anhydrous glycerin, and tested with litmus and turmeric paper, no acid reaction is observed unless water be added or the tests exposed to the air. Such a solution is very hygroscopic, and in a short time sufficient moisture is absorbed to partially decompose the compound, and produce an acid reaction (boric). In alcoholic solution it exhibits similar properties.—Nat. Drugg., Jan. 28, 1887, 46.

FIXED OILS.

Stearic Acid—Preparation of Ointments and Stearates with the Commercial Article.—Mr. R. Rother gives formulas for preparing stearates of veratrine, zinc and lead, as well as different ointments, which see under "Cerata et Unguenta." He makes the following remarks respecting the commercial article: "The commercial stearic acid is a bland, white crystalline solid. It is nearly odorless, remarkably pure and definite and unchangeable. It is doubtless appropriately applicable in many instances, particularly in conjunction with petrolatum, and especially in cases where the odor of lard or oleic acid is objectionable. When ordered as 'stearic acid' it would be difficult to get from the wholesale drugists, but as 'hard stearin' an abundant supply can be had."—Drugg. Circ., Sept., 1886, 197.

Fixed Oils—New Method of Purification.—Mr. D. B. Dott has devised the following method for the purification of fixed oils, which gives in some cases very good results: The commercial oil is agitated with about one-twentieth of its volume of 10 per cent. solution of permanganate of potassium. Dilute sulphuric acid is then added, and the mixture well shaken. After standing a sufficient time to allow the water to settle, the oil is filtered. The oil is thus much improved in appearance, and is not, as far as Mr. Dott has observed, in any way deteriorated. The experiments have so far heen made only with three oils, and the method requires to be further tested. It works well with olive and almond oils, but is not so successful with linseed oil.—Phar. Jour. and Trans., May 21, 1887, 941.

Fixed Oils—Determination of the Presence of Mineral Oil.—Mr. J. Birl notices that among other fixed oils olive oil has recently been found adulterated with mineral oil. He proposes the following method for its detection, which may be rapidly executed. 65 grams of the purest caustic potassa are dissolved in 95 % alcohol, and the solution made of such strength that 10 cc. are accurately saturated by 10 cc. of normal sulphuric acid; the above quantity of alkali making about 1 liter. 10 grams of the suspected oil are boiled for ten minutes in a porcelain vessel with 40 cc. of the normal potassa solution, water is then added to bring the weight to 100 grams, if necessary again heated to effect complete solution of the soap, and the liquid, after addition of a few drops of a 1 % solution of phenolphthalein, is titrated in the ordinary manner with normal sulphuric acid. In the case of pure oils, such as almond, benne, cottonseed, cod-liver oil, linseed or olive oil, not more than 6 cc. of acid are required; pure oils from cruciferous seeds and castor oil require 7–8 cc.; olive oil containing 10 % mineral oil requires 8 cc., with 20 % mineral oil 11 cc. The sample of adulterated olive oil examined by the author required from 14–17 cc. of normal sulphuric acid.—Pharm. Zeitsch. f. Russl., 1887, 65.

Fixed Oils—Examination.—Mr. J. Herz records a series of examinations of fixed oils, embracing olive, almond, ground-nut, benne, poppy and rape-seed oils, by the iodine-addition method of Hübl, giving the results in form of a tabulated statement, for which reference may be had to the original paper in Rep. f. anal. Chemie, 86, 604–606.

Fixed Oils—Examination.—Mr. T. A. Ellwood describes the different methods suitable for the examination of the liquid fixed oils of the B. P., but more particularly for the examination of castor oil, almond oil, olive oil and linseed oil. The points to be determined in the case of almond and olive oil are the sp. gr., the amount of free acid present, the amount of KOH required for complete saponification, the bromine absorption power, the elaidin test, the rise of temperature on adding to 50 cc. of this oil 10 cc. of H_2SO_4 sp. gr. 1.84. In the case of linseed and castor oil, the one or the other of these tests is necessarily omitted. For the particulars of the different methods and their application, see the author's paper in Pharm. Jour. and Trans., Dec. 25, 1886, 517–520.

Fixed Oils—Saponification-Equivalents—Mr. Alfred H. Allen remarks that the saponification method of examining fatty oils, originally applied by Kœttstorfer to the examination of butter, has been employed by various chemists for differentiating other oils, and has proved one of the most valuable methods of analysis yet devised. He has taken the trouble to compile the following table, which gives, in most cases, the number of samples on which the figures are based, together with the percentage of caustic potash required for saponification, and the "saponification-equivalent" corresponding thereto. This last value is found by dividing the percentage of KHO required to saponify the oil into 5610. It represents the number of grammes of an oil which would be saponified by one liter of a normal solution of any alkali. In the case of the glycerides, the saponification-equivalent is one-third of the molecular weight, but in the case of monatomic ethers, like those which essentially constitute sperm oil and beeswax, the saponification-equivalent is identical with the molecular weight.

Nature of Oil.	Initial of Observer.	No. of Samples.	Percentage of KHO for Saponification.	Saponification Equivalent.
A. Oleins—				
Lard oil	S.	.	19.1 to 19.6	285 to 296
Olive oil	K., S., V.	30	19.1 to 19.6	
Olive oil	LA.	40	18.93 to 19.26	
Almond oil (sweet)	V.	12	19.47 to 19.61	
Arachis oil	V., M.	2	19.13 to 19.66	
Tea oil	Davies.	1	19.55	
Sesamé oil	V., M., A.	3	19.00 to 19 24	
Cottonseed oil	S., D., V., M., A.	8	19.10 to 19 66	
B. Rape Oil Class—				
Colza and Rape oils	K., D , S.	8	17.08 to 17.90	313 to 330
Rape oil	LA.	44	17.02 to 17.64	
Mustardseed oil	V., A.	2	17.4 to 17.5	
Cabbageseed oil	Davies.	1	17.52	
C. Vegetable Drying Oils—				
Linseed oil	S , D , M., LA.	9	18.74 to 19.52	286 to 300
Poppyseed oil	V., M.	2	19.28 to 19.46	
Hempseed oil	V.	1	19.31	
Walnut oil	V.	1	19.60	
Nigerseed oil	S.	2	18.9 to 19 1	
D. Marine Oleins—				
Codliver oil	A., V.	2	18.51 to 21.32	250 to 303
Menhaden oil	A.	1	19.20	
Pilchard oil	S.	.	18.6 to 18.75	
Seal oil	S., D.	4	18.9 to 19.6	
Southern whale oil	D.	1	19.31	
Northern whale oil	S., A.	4	18.85 to 22.44	
Porpoise oil	A.	2	21.60 to 21.88	
E. Butter Class—				
Butter fat	K., V., M., A.	large.	22.15 to 23.24	241 to 253
Cocoanut oil	V., M.	5	24.62 to 26.84	209 to 255
Palmnut oil	V.	1	22.00 to 24.76	
F. Stearins, etc.—				
Lard	K., V., A.	7	19.20 to 19.65	277 to 294
Tallow	K., D.	9	19.32 to 19.80	
Dripping	K.	2	19.65 to 19.70	
Butterine	M., A.	large.	19.35 to 19 65	
Goose fat	V.	1	19.26	
Bone fat	V., LA.	2	19.09 to 19.71	
Palm oil	V., M.	3	19.63 to 20.25	
Cacao Butter	V.	1	19.98	
G. Fluid Waxes—				
Sperm oil	S., D., A.	10	12.34 to 14.74	380 to 454
Bottlenose oil	A., LA., D.	5	12.30 to 13.40	419 to 456
H. Solid Waxes—				
Spermaceti	H.	3	12.73 to 13.04	432 to 441
Beeswax	H., Hl., A.	large.	9.2 to 9.7	. . . . .
Carnauba wax	Hl., V., H., LA.	4	7.90 to 8.51	. . . . .
Chinese wax	A.	1	6.5	. . . . .
I. Unclassed—				
Shark-liver oil	A.	8	14.00 to 19.76	284 to 400
Wool fat (suint)	V.	1	17.00	330
Lanolin	A.	1	9.83	570.9
Olive-kernel oil	V.	1	18.85	298
Castor oil	S., D., A., V.	6	17.60 to 18.15	309 to 319
Japanese wood oil	Davies.	1	21.1	266
Japan wax	H., Hl., V., A.	8	21.01 to 22.25	252 to 267
Myrtle wax	D., A.	2	20.57 to 21.17	265 to 273
Blown rape oil	LA., A,	3	19.8 to 20.4	275 to 284
Colophony	H., A., D.	4	17.0 to 19.3	290 to 330

—Amer. Jour. Pharm., Sept. 1886, 433–435; from The Analyst, 1886, 145.

Fixed Oils—Action on Metals.—Mr. I. J. Redwood communicates the results of some experiments to determine the relative action of different fixed oils (used as lubricants) on metals. The metals experimented on were iron, brass, tin, lead, zinc and copper. The oils experimented with were olive oil, rape oil, tallow oil, lard oil, cotton seed oil, sperm oil, whale oil, seal oil, and mineral lubricating oil. He finds that by the method of his experiments, which is explained, that:

Olive oil acts least on tin and most on copper.

Rape oil has no action on brass and tin, acts least on iron and most on copper.

Tallow oil acts least on tin and most on copper.

Lard oil acts least on zinc and most on copper.

Cotton seed oil acts least on lead and most on tin.

Sperm oil acts least on brass and most on zinc.

Whale oil has no action on tin, acts least on brass and most on lead.

Seal oil acts least on brass and most on copper.

Mineral lubricating oil has no action on zinc and copper, acts least on brass and most on lead. He regards it, on the whole, as having the least action on the metals experimented with, while sperm oil has the most. The latter, or rape, however, are the best oils to use in admixture with mineral oil for lubricating heavy machinery, as they have the least effect on brass and iron, which two metals generally constitute the bearing surface of an engine. Tallow oil should be used as little as possible.—Pharm. Jour. and Trans., July 24, 1886, 67.

Castor Oil—Detection of Other Oils in Admixture.—Mr. Finkener has made the observation that alcohol of sp. gr. 0.829, obtained by mixing 90 volumes of alcohol and 10 volumes of water, is capable of dissolving castor oil at moderate temperatures nearly in all proportions, whilst other fixed oils do not dissolve. An admixture of 10 per cent. of such oils as olive, benne, linseed, cottonseed, or rapeseed oil, will form turbid liquids when the suspected oil is shaken with five times its volume of such alcohol at the temperature of the room, pure castor oil forming under these conditions a permanently clear solution.—Arch. d. Pharm., Jan. 1887, 36; from Chem. Ztg.

Benne Oil—Detection in Admixture with Olive and Other Fixed Oils. Mr. C. Schaedler draws attention to the delicacy of the method for the determination of benne oil in admixture with olive or other fixed oils, which method is dependent on the formation of a red color when the oil is shaken with hydrochloric acid and cane sugar. If 1 cc. of pure benne oil is shaken with 1 cc. of pure hydrochloric acid, s. g. 1.125, and 1 gram cane sugar, a rose-red color is developed in 15 minutes, changing to violet in 25 minutes, and increasing in intensity until, after 5 hours, the *acid* has assumed a violet color, corresponding in intensity to that of a solution of iodine in bisulphide of carbon or chloroform. In the case of all other fixed oils, this color reaction does not begin until after ¾–1 hour. Olive and almond oils, containing as little as ¼ per cent. of benne oil, exhibit the reaction in from 20–25 minutes. The failure of some experimenters to find the reactions available rests upon the fact that they searched for the color in the oil and not, as is proper, in the acid.—Arch. d. Pharm., Feb. 1887, 185; from Rep. f. Anal. Chem., 86, 519.

Hemp Seed Oil—Characters of Oleic Acid.—Messrs. A. Bauer and K. Hazura have prepared the oleic acid of hemp seed oil as follows: The expressed oil of the seeds was saponified with soda, the soda soap decomposed with sulphuric acid, the crude oleic acid in alcoholic solution saponified with ammonia, the ammonia soap converted into barium soap by treatment with chloride of barium, the barium soap dissolved in ether, the ethereal solution treated with hydrochloric acid to liberate the oleic acid, and the ether distilled off, after shaking with water, in a current of hydrogen. The residual oleic acid was finally dried in sulphuric acid. So obtained

Hemp Oleic Acid possesses properties which correspond with those of linoleic acid completely, as does also its composition—$C_{16}H_{28}O_2$. When melted at low temperature with caustic potassa it yields myriotic, acetic, and formic acids chiefly, together with a small quantity of azelainic or lepargylic acid—$C_9H_{16}O_4$.—Arch. d. Pharm., Sept. 1886, 804; from Monatsh. f. Chem., vii, 216.

Cottonseed Oil—Bechi's Test for its Presence in Olive Oil.—In a lengthy and exhaustive communication, the Commission of Florence has made public the results of the experiments upon the value of the "Bechi's Test" as a reliable and positive indicator of the presence of cottonseed oil, fraudulently contained in olive oil. The method of Professor Bechi, as used by the Commission, consists in the subjection of a sample of the suspected oil to the heat of boiling water, after first having added an alcoholic solution of silver nitrate, and amylic alcohol and oil of rape, in the manner and proportions hereinafter indicated. Take one grain of crystallized silver nitrate, and dissolve in the smallest possible quantity of water (about 1 cc.) and add 200 cc. of alcohol (96°). The addition, also, of 20 cc. of sulphuric ether is a good one, in that it makes the reagent better miscible with the oil to be examined, but it is not necessary. On the other hand prepare a solution composed of 85 parts of amylic alcohol and 15 parts of oil of rape seed. These reagents should be made as needed, and not kept on hand for any length of time. To apply the test, Prof. Bechi takes 10 cc. of the oil to be examined, adds 1 cc. of the alcoholic solution of silver nitrate, and then from 8 to 10 cc. of the mixture of amylic alcohol and oil of rape; agitating strongly and then heating on a water bath for 5 or 10 minutes. In the case of pure oils, the color remains the same as it was after the addition of the reagents. In the event that sophistication has been practiced with cottonseed oil, there will be produced a brownish color, or turbidity, of a varying grade, from a very light brown to a deep maroon or black, according to the quantity of cotton oil present.

With these data furnished by Prof. Bechi, and after having assisted in experiments made by him in support of his method, the Commission instituted a series of long and diligent personal experiments, numbering over 200, in the chemical, biological and hygienic laboratory of the Royal Institute; adhering strictly to the rules as laid down, measuring exactly, in each instance, the quantities of oils and reagents, and using tubes of equal diameters—or, in one word, employing the same conditions in all experiments, in order to render the result truly comparative. The clear, concording and uniform results, obtained in the experiments as detailed, make it evident that the method proposed by Prof. Bechi, used with care, and in the manner indicated, has not failed the Commission in a single instance, and they feel that they cannot do less than to most strongly urge its general adoption, as a reliable and positive indicator for the existence of cottonseed oil in olive oil, fraudulently added.—Amer. Jour. Phar., June 1887, 280–285.

Fixed Oil of Millet—Characters, etc.—See *Millet Seed*, under "Materia Medica."

Linseed Oil—Medicinal Use.—According to a correspondent of the "Boston Med. and Surg. Journal," linseed oil has been found to be a very efficient remedy in pruritus ani with no rectal complications; when freely used externally it gives immediate relief.—Amer. Jour. Phar., June 1887, 274.

Croton Oil—Investigation of Constituents.—The observations of Mr. H. Senier (see Proceedings 1878, 501, and 1884, 195), that croton oil contains two distinct principles, the one a rubefacient, the other a drastic purgative, has led Mr. Ernst von Hirschheydt, at the suggestion of Prof. Kobert, to carry out a series of experiments which show that the oil contains Buchheim's crotonoleic acid, partly in the free state and partly as glyceride. The latter is not poisonous, but the free acid is very irritating and drastic. The glyceride being decomposed by the pancreatic ferment, thereby becomes purgative when taken internally; but the same effect may be produced by giving crotonoleic acid in pills covered with keratin with the view of preventing irritation of the stomach; but obviously, irritation of the intestines will be produced by both compounds.

The solubility of croton oil is mainly influenced by the age of the oil, and samples are sometimes met with which dissolve in alcohol in all proportions; but it does not seem necessary that such oils should contain the crotonoleic acid only in the free state, though the acid is readily soluble in alcohol.

For the preparation of *crotonoleic acid*, Kobert recommends digestion in a water-bath of the alcohol-soluble portion of croton oil with an excess of concentrated baryta solution; the thick white mass is thoroughly mixed and washed with cold distilled water, whereby coloring matter and barium acetate, butyrate and tiglinate are removed; the residue is drained, dried and exhausted by ether, which leaves behind the barium salts of stearic, palmitic and lauric acids. On evaporating the ethereal solution a mixture of barium oleate and crotonoleate is obtained, of which the latter only is dissolved by alcohol; this solution is decomposed by the careful addition of H_2SO_4, and after filtering evaporated. The main difficulty in the preparation of free crotonoleic acid lies in the readiness of its being decomposed by baryta water under the influence of too high a heat.

Sodium crotonoleate, alters the walls of the blood vessels and causes hemorrhages.—Chem. Ztg., 1887, No. 28, 416; Am. Jour. Ph.

Expressed Oil of Nutmeg—Method of Examination.—Mr. E. Dieterich (Helfenberger Annalen, 1887), in view of the variable character of commercial expressed oil of nutmeg, has devised a method of examination. He prepares by extraction of nutmegs with ether, a normal oil for the purpose of comparing the commercial article, employing the titration method recommended by Hübl for wax (see Proceedings 1885, 200). The differences in the ether numbers and saponification numbers were found to be very considerable, while they differed also very decidedly from the normal sample in their melting points and sp. gr., though no great importance can be given to these latter.—Arch. d. Pharm., June 1887, 495.

Oleum Theobromæ—Acidity and Change by Age.—Mr. E. Dieterich (Helfenberger Annalen, 1886), observes that, as in the case of most fixed oils, butter of cacao is never entirely devoid of free acid. 1 gram each of different samples required 0.06—0.16 cc. of $\frac{1}{10}$ N. potassa solution for neutralization, and this quantity after three months was doubled, while after six months three times as much potassa solution was required, the fat offering scarcely greater resistance to become rancid than other fats. —Arch. d. Pharm., June 1887, 495.

Cod Liver Oil—Paraffin Oil an Adulterant.—Attention is drawn in Pharm. Zeitschr. f. Russl. (xxv, 792), to paraffin oil as a new adulterant for cod liver oil. It can be recognized readily by its failure to saponify.

Lard—Invariable Presence of Free Acid.—Mr. E. Dieterich (Helfenberger Annalen, 1886) draws attention to the fact that lard perfectly free from acid, as required by the Germ. Pharm., is not obtainable. The acid was determined in lard immediately after rendering, and it was found that 1 gram required from 0.10—0.15 cc. $\frac{1}{10}$ N. potassa solution for neutralization, corresponding to 0.00282—0.00423 per cent. of free acid, calculated as oleic acid. The melting points of the specimens of lard examined were between 36 and 38°, the spec. grav. between 0.934 and 0.938. —Arch. d. Phar., June 1887, 494.

Suet—Acidity, Specific Gravity and Melting Point.—Mr. E. Dieterich (Helfenberger Annalen, 1886) has examined a large number of samples of mutton and beef suet, and finds that they were without exception acid and that neutral suet does not exist. 1 gram of suet required from 0.07 to 0.35 cc. of $\frac{1}{10}$ N. solution of potassa, mutton suet requiring the larger and beef suet the smaller quantities. The melting point of mutton suet is between 48.5 and 50.5; of beef suet 47.5 to 48. The specific gravity of mutton suet lies between 0.937 and 0.952; of beef suet between 0.943 and 0.952.—Arch. d. Phar., June 1887, 496.

Bromo-iodinized Butter—Preparation and Uses.—Trousseaux recommends "Bromo-iodinized butter" to be spread on bread, and used like ordinary butter. It is made according to the following formula:

℞.	Potassii iodidi	0.06
	Potassii bromidi	0.25
	Sodii chloridi	2.0
	Butyri recentis	125.0

—Phar. Centralh. xxviii, 368.

Spermaceti—Detection of the Presence of Stearic Acid.—Spermaceti is frequently adulterated with stearic acid. A writer in "Pharm. Zeitschr. f. Russl." (xxvi, 249) recommends that to detect the adulteration a definite quantity be fused in a capsule and ammonia added, stirring several moments. Stearic acid forms an ammonia soap which is taken up by water and subsequently decomposed with hydrochloric acid. By this process one per cent. of stearic acid can be detected.

CARBOHYDRATES.

Carbohydrates—New Reagents.—Mr. Edward Kremers has made a series of experiments to determine the value of new tests for sugar proposed recently by Mr. Hans Molisch. These tests are based upon the observation that when sugar is shaken with a little alcohol solution of *a* naphthol or thymol, and a large excess of sulphuric acid is added, certain color reactions are produced which will permit the detection of 0.0001 percent. of sugar. If *a*-naphthol is used a deep violet color is produced, while thymol produces a deep red coloration. The reactions are produced with cane-sugar, milk-sugar, glucose, levulose and maltose, and with the carbohydrates and glucosides capable of yielding glucose by the action of sulphuric acid. Inosite, mannite or quercite, do not produce the reaction. The only other substances besides sugar that produce this reaction are vanillin, anethol, methylsalicylate, and a few similar bodies. Mr. Kremers' experiments have been extended to phenol, carvol, resorcin and pyrogallol, which, with the exception of phenol, produce at one stage or another, a red color with cane-sugar. Phenol produces a yellowish-brown becoming darker; whilst benzene, petroleum benzin, methyl alcohol, ethyl alcohol, amyl alcohol, and lactic acid also produced color reactions, though not so characteristic as those of the first-named group. The author's observations tend to show that these reactions are not characteristic of the phenols as a class, but that also substances of the marsh-gas series containing the hydroxyl group, and even substances containing no OH group whatever, are capable of producing similar reactions. This fact, however, does not make the tests with *a*-naphthol, thymol, etc., any the less valuable.—West. Drugg., March 1887, 72–73.

Irisin—A New Carbohydrate.—Mr. O. Wallach has isolated from the rhizomes of *Iris Pseud-acorus* a new carbohydrate, distinct from any of the carbohydrates that have as yet been isolated, which he has named irisin. It is a pure white substance, forms with cold water a pasty magma, and by very gentle heating forms a perfectly clear solution, which solution is optically dextrogyre, and does not give any color reaction with iodine. It is apparently very closely related to, though not identical with inulin.—Liebig's Annalen., vol. 234, 364.

Starch—Non-bluing Effect of Iodine on Certain Kinds.—Mr. Dafert states that certain starches are not colored blue by iodine. The starch in the millet grains of Panicum miliaceum, *Lin.* var. candidum glutinosum, in contact with iodine solution, is colored yellowish-brown, red-brown, or brown, the color disappearing on heating and reappearing on cooling. The cold prepared extract does not give a color reaction with iodine; hence dextrin-like compounds are absent. The reaction with iodine is the only means for distinguishing the above variety of millet from the variety candidum.—Phar. Zeitsch. f. Russl., 1886, 660; Am. J. Phar.

Starch—Action of Saliva.—Mr. E. Bourguelot reports an extensive series of experiments made to determine the action of the saliva on starch. He finds that the saliva acts only on the starch which has undergone hydration, and it was found that the hydrating action of water begins at about 52°, and increases somewhat irregularly up to 74°, beyond which point an increased temperature exerts no sensible effect. He finds, furthermore, that it is the diastase in the saliva which assists the hydrating action of the water.—Compt. Rend., civ, 71–74 and 177–180.

Soluble Starch.—Characters and occurrence in *Saponaria officinalis*, L., which see under "Materia Medica."

Iodized Starch—Value as an Antiseptic Dressing.—Mr. Joseph W. England draws attention to the value of iodized starch, which has been in use for some months, at his suggestion, in the Philadelphia Hospital, as an antiseptic. Reasoning that the antiseptic activity of iodoform and bismuth subiodide must depend, in part or in whole, upon the iodine freed in their decomposition, in contact with decomposing putrescent organic matter, it was thought that if an iodized compound, readily decomposable, was subjected to the same conditions, that it would induce the same healthful process in the latter case, as well as in the first. Full experience has demonstrated the value of the theory in this instance, and iodized starch is now used daily in our hospital practice, and recognized as a valuable adjunct in certain forms of antiseptic treatment. It is applied in the same manner as other antiseptics, namely: first washing out the wound with pure water, and drying out as far as practicable, then thoroughly dusting in with iodized starch and covering the wound, even beyond its outer edges. The applications are generally made in the morning and evening.—Amer. Jour. Phar., April 1887, 178–179.

Lichenin—Conversion into Sugar.—Mr. R. W. Bauer has converted lichenin, obtained from Iceland moss, into sugar, and finds the latter to possess characters which place lichenin in the series of carbohydrates yielding dextrose.—Arch. d. Phar., Sept. 1886, 803; from Jour. prakt. Chem., 34, 49.

Gummo-Phosphate of Calcium—A New Compound.—M. Sambuc says that the preparations in use under the names of chlorhydro-, lacto-, and citro-phosphate of calcium, are not double salts, but mixtures of monocalcic phosphate with chloride, lactate or citrate of calcium. Five gm. for instance, of the phosphate are usually found mixed with six gm. of chloride of calcium. He proposes to replace the hydrochloric, lactic or citric acids with gummic acid. As is well known, 100 gm. of arabic gum contains 0.97 gm. of lime, 0.63 gm. of potassa, and 0.27 gm. magnesia; these quantities of potassa and magnesia correspond to 0.78 gm. of lime; 100 gm. of gum contains therefore a sufficient quantity of gummic acid to combine with 1.75 gm. (0.97 gm. + 0.78 gm.) of lime, and consequently to render soluble 10 gm. of bicalcic phosphate which contain 3.50 gm. of lime, of which one-half remains combined with the phosphoric acid On these bases M. Sambuc proceeds to isolate the gummic acid by dialysis, using 300 gm. cleaned gum, 600 gm. water, and 24 gm. ac. hydrochlor. at 1.18. In two days the calcium, potassium and magnesium are eliminated by exosmosis, and the dialyser contains only a solution of gummic acid. He then takes 66 gm. phosphate of sodium (before efflorescence), and 40.50 gm. crystallized calcium chloride, dissolves separately and mixes. After washing and draining he mixes it while yet damp with the dialysed solution of gummic acid, which dissolves it readily. The quantities given, produce 32 gm. bicalcic phosphate. The product is feebly acid; it contains gummate of calcium which advantageously replaces the salts of calcium mixed with the monocalcic phosphate in the composition first indicated. M. Sambuc's preparation does not keep well. If a method could be devised for making it permanent, the gummo-phosphate of calcium might prove very useful.—Archives de Pharm., June 1887.

Gelosin—A New Mucilaginous Substance.—Mr. Guérin draws attention to gelosin, a new mucilaginous substance extracted from Gelidium corneum, *Lamouroux*, an alga of Japan, and is found in commerce as dry, whitish fragments, extremely flexible. Gelosin forms an excellent vehicle for the administration of soluble medicaments or for making suppositories, cataplasms, bougies, etc. Mr. Guérin has presented to the Société de Thérapeutique, of Paris, some specimens of gelosin medicated with camphor, creasote, sulphate of zinc, turpeth mineral, cocaine, extract of belladonna, iodoform, corrosive sublimate, carbolic acid, coal tar, etc. To manipulate this substance, all that is required is to add an equal weight of warm water to dissolve it, and then to incorporate with it the medicament. Conveniently sterilized gelosin might be advantageously employed in bacteriological researches.—Jour. de Phar. et de Chimie, xiv., 318; Amer. Jour. Pharm., Dec. 1886, 612.

Sugars—New Reactions.—Mr. H. Molisch draws attention to two new reactions for sugar, which are applicable not to a special kind, but to sugars in general, giving equally good results with saccharose, lactose, glucose, levulose and maltose. The reactions are about equally sensitive, and much more so than Trommer's or Fehling's, being distinct in the presence of 0.00001 per cent. of the sugar. The first method consists in adding to 0.5–1.0 cc. of the liquid in a test tube 2 drops of an alcoholic solution of *a-naphthol* (containing 15-20 per cent.), shaking, then adding an equal or double volume of concentrated sulphuric acid and shaking rapidly. In the presence of sugar the liquid assumes a deep violet color. The second method consists in substituting *thymol* for *a*-naphthol. Under these conditions a coloration is produced, which the author characterizes as vermillion-ruby-carmine-red, becoming carmine-red on dilution with water.—Arch. d. Ph., Sept., 1886, 803; from Monatsh. f. Chem., vii, 198.

Saccharates—Chemical Constitution.—While a number of saccharates, particularly those of calcium, barium and lead, have been known and studied for many years, their chemical nature and constitution is still open to investigation, the views of different experimenters being greatly at variance. With a view to determine their chemical nature, Dr. Wm. Strohmeyer has now prepared a number of saccharates, and reports his results in a comprehensive paper.

Saccharate of Barium.—This compound was first studied by Peligot, who assigns to it the formula $C_{12}H_{22}O_{11},BaO$. Stein subsequently reviewed the experiments of Peligot, and, believing that sugar in its character of a polybasic acid, united with the barium oxide under separation of water, corrected the formula of the compound to $C_{12}H_{20}BaO_{11}$. Dr. Strohmeyer prepared pure saccharate of barium as follows: A concentrated solution of baryta (20 g. : 100 g.) was mixed with 500 g. of a 6 per cent. solution of cane sugar, the clear liquid heated to boiling and, protected from the air, allowed to cool. The warty crystals which gradually separated were collected on a suction filter, rapidly freed from mother liquor, washed with little water, pressed between blotting paper, and dried over sulphuric acid. The saccharate so obtained constituted a white, crystalline powder, which dissolved with tolerable readiness in water, but not in alcohol. The analytical data obtained by the author confirm the formula of Peligot, viz.: $C_{12}H_{22}O_{11},BaO$, and the view supported also by the experiments of Soubeiran and of Gerhardt, that saccharate of barium is an addition product composed of equal molecules of cane sugar and barium oxide.

Saccharates of Calcium.—These compounds have been studied by Peligot, Soubeiran, and Pelouze, and more recently by Benedickt and by Von Lippman. The latter describes three compounds, viz.: Mono-calcium saccharate, $C_{12}H_{22}O_{11},CaO + 2\ H_2O$; Di-calcium saccharate, $C_{12}H_{22}O_{11}, 2CaO + 2\ H_2O$; and tri-calcium saccharate, $C_{12}H_{22}O_{11}, 3\ CaO + 3\ H_2O$. The

Mono-calcium saccharate was prepared by the methods proposed by different experimenters, the most satisfactory being that of Peligot. This consists in adding alcohol to a clear solution of saccharate of calcium, containing sugar in excess; the separated saccharate, when washed and dried at 100–110° C., gave analytical figures proving the compound to be anhydrous and of the following composition: $C_{12}H_{22}O_{11},CaO$. The

Tri-calcium saccharate was obtained, according to the statements of Peligot, by boiling the solution of mono-calcium saccharate. The magma that thus separated was washed upon a suction filter with hot water and dried. Like the mono-calcium saccharate, this is anhydrous when dried at 100–110°, its composition corresponding to the formula $C_{12}H_{22}O_{11}, 3CaO$. In their chemical constitution the two calcium saccharates are therefore addition compounds, composed of 1 molecule of cane sugar, with 1 and 3 molecules, respectively, of calcium oxide.

Saccharate of Lead.—As in the case of the afore-mentioned saccharates, the different formulas proposed do not give like results. He found the methods of Soubeiran and of Peligot, with slight modifications, to give identical results. The compound is readily obtained by mixing aqueous solutions of monocalcic saccharate and of acetate of lead in molecular proportion, and precipitating with alcohol. When washed and dried it constitutes a white crystalline powder, insoluble in cold or warm water, readily soluble in acetic or nitric acid, and very prone to absorb carbonic acid. The analytical results show that under the above conditions a di-plumbic saccharate is formed, and not a mono plumbic saccharate, as might be expected. The figures obtained correspond more nearly to the formula $C_{12}H_{22}O_{11},2PbO$, than to the formula $C_{12}H_{22}O_{11},PbO$. The author also attempted the preparation of

Saccharate of Aluminium, but, notwithstanding numerous experiments, failed to obtain compounds containing appreciable quantities of alumina. Similarly it was endeavored to produce

Saccharate of Chromium, but no compound of definite constitution could be obtained.—Arch. d. Pharm., March 1887, 229–245.

Caramel—Presence of Arsenic.—Mr. O. Schweissinger has determined the presence of notable quantities of arsenic in caramel. He attributes its presence to the sulphuric acid employed to convert the starch into the glucose used for the preparation of the caramel.—Arch. d. Phar., April, 1887, 312; from Pharm. Centralh., 1887, 62.

Glucoses—Conversion into Dextrin.—Messrs. E. Grimaux and L. Lefevre have converted pure glucose into dextrin by dissolving it in eight times its weight of hydrochloric acid of s. g. 1.026, distilling in a vacuum on the water-bath, dissolving the amber-colored residue in water, precipitating by alcohol, and redissolving and reprecipitating the product several times. It was obtained white by decolorizing its aqueous solution with animal charcoal, evaporating in vacuo, etc. The product resembles ordinary dextrin in its physical characters, being white, hygroscopic, and forming gummy solutions. In its general properties it resembles the dextrin obtained by Musculus by the action of sulphuric acid on glucose in presence of alcohol.

Galactose from milk sugar yields a galacto-dextrin which resembles gluco-dextrin.—Compt. rend., ciii., 746.

Glucose—Rapid Change in Urine.—Mr. Méhu draws attention to the fact that owing to the presence of various organized ferments in urine, the sugar, particularly in warm weather, is rapidly decomposed, alcohol and carbonic acid being formed. He therefore advises that the urine be examined for sugar as soon as possible after its passage.—Arch. d. Pharm., May 1887, 412; from Jour. de Pharm. et de Chim., 1887, xv, 147.

Arabinose—Composition.—Recent investigations of Mr. H. Kiliani have determined indisputably that arabinose has not, as has hitherto been assumed, the formula $C_6H_{12}O_6$, but that its composition is properly represented by the formula $C_5H_{10}O_5$. The formula of

Arabinose Carbonic Acid, also, is not $C_7H_{14}O_8$, but it is identical with that of gluconic acid, viz., $C_6H_{12}O_7$.—Arch. d. Pharm., June 1887, 539; Ber. d. D. Chem. Ges., 1887, 339.

Arabinose—Action of Hydrocyanic Acid.—In a former paper, Mr. H. Kiliani has shown that levulose and dextrose readily unite with hydrocyanic acid to form cyanhydrides, which by appropriate treatment are convertible into the well crystallizable lactones of their corresponding carbon acids. He has now studied the action of this acid on arabinose, and has obtained corresponding results. The amide of arabinose carbonic acid, $C_7H_{15}O_7N$, is first formed by the reaction, and then, by further treatment, was converted into the lactone of arabinose carbonic acid, $C_7H_{12}O_7$, forming colorless, strongly glistening needles.—Arch. d. Pharm., Feb. 1887, 182; from Ber. d. D. Ch. Ges., xix, 3029.

Furfurol—Formation during Various Culinary Operations.—Völkel has first shown that furfurol is produced by the distillation of sugar and of wood, and that it can also form during the boiling of concentrated sugar solutions. Mr. Hugo Schiff now finds that furfurol is frequently produced during the different culinary operations. It is formed during the preparation of caramels from sugar, during the baking of bread and cake, during the roasting of coffee and cacao, and by the boiling of certain vegetables, such as cauliflower, etc. Its determination is exceedingly easy and precise, since furfurol produces with xylidine (or also aniline) intensely red products of reaction. Paper is moistened with a mixture of alcohol, xylidine and glacial acetic acid, and exposed to the vapor of furfurol, whereby it is colored intensely red.—Arch. d. Pharm., May 1887, 450; Ber. d. D. Chem. Ges., 1887, 540.

ORGANIC ACIDS.

Methyl-Ethyl Acetic Acid—Characters of the Zinc Salt, etc.—Some time ago Mr. A. Rennard described, besides other products of the dry distillation of colophony, an acid having the formula $C_5H_{10}O_2$, which he believed to have strong analogy with ordinary valerianic acid (Isopropyl acetic acid). Mr. E. Schmidt, comparing the properties of this acid and its salts, finds that it corresponds more closely to methyl-ethyl acetic acid than to ordinary valerianic acid. He has prepared the zinc salt of methyl-ethyl acetic acid, and has obtained it in transparent crystalline needles, more than a centimetre in length, which lost none of their weight by drying for a short time at 100° C., but if exposed or kept for some time, lose a portion of their acid constituent and become basic. It is more readily soluble in cold than in hot water, and dissolves much better in the moist condition than when it has become dry, since it is difficult to again moisten the crystals, and thus secure contact with water. —Arch. d. Pharm., 1886, 540–542.

Vinegar—Test for Sulphuric or Hydrochloric Acid.—Mr. Föhring recommends sulphide of zinc as a test for the presence of sulphuric or hydrochloric acid in vinegar. This compound is not decomposed either by dilute or strong acetic acid, but very easily by the mineral acids. If, therefore, pure vinegar is heated with a little sulphide of zinc in a test tube, it will not give off the smell of sulphydric acid.—Pharm. Centralh., 1886, 285.

Dr. Hager has experimented in the same direction. He finds the reaction first described by Jorisson to give the best results, and carries it out as follows: One large or two small drops of gurjun balsam are mixed with 35 to 40 drops of pure acetic acid in a small test tube, heating and shaking to secure a uniform mixture. On the addition of two, or, at most, three drops of the suspected vinegar, the presence of hydrochloric acid is revealed by an immediate blue violet color, whilst in the presence of free sulphuric acid the reaction takes place somewhat slower. The test can be made within a period of two or three minutes.—Arch. d. Pharm., July 1886, 597; from ibid.

Formic Acid—Determination by Oxidation.—Mr. J. Klein determines the percentage of aqueous solution of formic acid by rendering the solution faintly alkaline with soda solution; solution of permanganate is added, the mixture is boiled, some oxalic acid is added, followed by sulphuric acid, and the titration is then continued with permanganate solution to permanent redness. The quantity of permanganate solution required for the oxidation of the added quantity of oxalic acid is deducted from the total quantity employed, the difference being the quantity required for the oxidation of the formic acid in the sample. The calculation is made on the basis that 2 mol. of permanganate of potassium are required to oxidize 5 mol. of formic acid. The method is also applicable to the determination of *organic substances in water*, the details as applied to this being given.—Arch. de Pharm., June 1887, 522–531.

Propionic Acid—Preparation from Colophonium.—Mr. Renard obtained propionic acid in abundance from tar produced from colophonium. The aqueous solution of the acid distils at 98.5 to 99.5°, and at the latter temperature, which is maintained for a long time, a distillate containing 30 per cent. propionic acid is obtained. The thermometer then suddenly rises to 141–142°, and pure propionic acid distills. It remains liquid at —50°, has the s. g. 1.0089 at 0°, and is soluble in all proportions in water, alcohol, ether and benzin.—Arch. d. Pharm., Nov., 1886, 939; from Jour. de Pharm. et de Chim., 1886, xiv, 288.

Lactic Acid—Characters of some of its Salts.—Mr. H. Meyer has prepared and studied the characters of several salts of lactic acid.

Lactate of Barium.—When the lactic acid, obtained by fermentation, is boiled with carbonate of barium, the solution filtered and evaporated, a neutral syrupy liquid is obtained, which has hitherto been regarded as uncrystallizable. The author has found, however, that after standing for a number of weeks, crystals begin to form, and the crystal centres rapidly grow until the entire syrup is converted into cauliflower-like formations. The air dried salt corresponds in its composition to the formula $Ba(C_3H_5O_3)_2 + 4H_2O$. By exposing the salt to drying over sulphuric acid it loses 3 mol. of water.

Lactate of Aluminium is obtained by accurately precipitating a solution of the barium salt by sulphate of aluminium. The salt is obtained in the form of hard crystalline crust by simple evaporation of the filtrate, and in the form of triclinic octahedrons by the slow evaporation of its alcoholic solution containing a little ether. Lactate of aluminium has the composition $Al_2(C_3H_5O_3)_6$, and is free from water of crystallization, and very permanent. By the addition of soda to the solution of aluminium lactate to neutrality

Lactate of Aluminium and Sodium is obtained. The double salt contains 5 mol. of water, 4 of which are given off at 100°.—Ber. d. D. Ch. Ges., xix, 2454.

Lactic Acid—Value as a Remedy in Diarrhœa of Children.—Prof. Hayme considers the green diarrhœa of children to be of microbian origin. He finds lactic acid remarkably useful in its treatment, administering it in the form of a 2 to 100 solution, a teaspoonful being given to the child a quarter of an hour after nursing. During the 24 hours 5 to 8 teaspoonfuls may be given, representing 40 to 60 cgm. of pure lactic acid. It is well supported.—Bull. Gén. de Thérap., May 30, 1887.

Valerianic Acid—Formation of Double Salts.—Mr. R. Rother has observed that the commercial valerianate of ammonium, which on a former occasion (Am. Jour. Pharm., June, 1884) he had shown to be an acid compound, is capable of dissolving a considerable quantity of magnesium carbonate, forming a new double salt:

Valerianate of Magnesium and Ammonium.—The new compound is readily obtained in the form of very soluble, non-deliquescent, crystalline masses, has a sweet taste, and is free from bitterness as well as the unpleasant valerianic odor. It is readily soluble in alcohol.

Valerianate of Magnesium is obtained by treating the acid with an excess of magnesium carbonate, but seems to be with difficulty obtained in a dry condition without undergoing some change.

Valerianate of Magnesium and Quinine is readily obtained in a dry crystalline condition if its solutions, obtained by mixing equivalents of the magnesium and quinine salts, are concentrated in presence of alcohol. Like the double salt of magnesium and ammonium, this compound is entirely odorless in the dry state.—Amer. Jour. Pharm., 1887, 171–173.

Salicylic Acid—Solvent Action of Certain Salts, etc.—It is known that the solution of salicylic acid in water is enormously augmented by the presence of certain salts of the monad metals, and that the resulting solutions have the physiological effect of free salicylic acid. It has been, however, shown that in these combinations the acid is not free in any sense, but that normal salicylates and acid monad salts are formed. Mr. R. Rother records a series of experiments made with a view to determine the chemical character of the product formed when the acid is dissolved by the aid of acetates, citrates, tartrates, phosphates, pyrophosphates and borates. The addition of acetic acid to a simply aqueous solution of a salicylate causes the precipitation of crystalline salicylic acid in profusion. It is therefore apparently remarkable that a normal acetate as abundantly dissolves free salicylic acid. It seems furthermore doubly strange that one molecule of the acetate conditions the solution of one molecule of the acid. This solution is however but temporary, as it gradually deposits a considerable proportion of free acid. When this liberated acid is reconverted into potassium salt and reunited with the remaining solution, no subsequent separation occurs, not even in the presence of any amount of excess of acetic acid. This result shows that a certain proportion of potassium acetate is essential to keep all the salicylic acid in solution in the presence of acetic acid largely in excess. It was found that this is effected when three molecules of the acetate react upon two molecules of salicylic acid, that is, in the proportion of 294 parts of the first and 276 parts of the second. Since the commercial potassium acetate is always more or less damp and indefinite, it is better to employ instead 300 parts of perfectly dry and well crystallized potassium bicarbonate neutralized with acetic acid aided by warmth. The expression for the reaction is written

$$3(KAc) + 2(HSl) = 2(KSl) + KAc(HAc)_2.$$

This makes it apparent that only enough acetic acid is displaced to generate one molecule of acid potassium acetate, which then protects two molecules of the salicylate in the presence of more acetic acid. This solution, when moderately dilute, has a not unpleasant acidulous taste, and hence widely different from the nauseous flavor of unmixed salicylate.

The results obtained with other salts are briefly shown in the following:

Potassium Citrate.—Two molecules (= 648 parts) of potassium citrate are required to form a perfect and permanent solution with three molecules (= 414 parts) of salicylic acid. The somewhat dilute solution has an acidulous, not disagreeable taste.

Potassium Tartrate.—Equal molecules (138 parts of salicylic acid and 235 parts of the tartrate) are required to hold all of the salicylic acid in solution, one-half a molecule of acid tartrate of potassium being formed and, for the greater part, thrown out of solution. In the case of

Rochelle Salt. Equal molecules (138 acid to 282 tartrate) are also required, and the result is practically a solution of salicylate of sodium and a precipitate of acid tartrate of potassium.

Sodium Acetate.—The results are practically the same as those obtained with acetate of potassium, as given above.

Sodium Citrate reacts on the same principle as the potassium salt.

Sodium Phosphate reacts molecule for molecule. The solution is not particularly agreeable. On the other hand,

Sodium Pyrophosphate dissolves two molecules of the acid (446 p. pyrophosphate to 276 p. acid), and the solution has a more pleasant taste.

Sodium Borate.—Two molecules (=276 p.) of the acid are dissolved by one molecule (=382 p.) of borate of sodium. In this case the boric acid is wholly set free, a circumstance which distinguishes this reaction from all of the others. The taste of the solution is very nauseous. Finally,

Ammonium Citrate appears to give results which are similar to those obtained with the other monad citrates. Certainty is not attainable on account of the difficulty to obtain a definite normal ammonium citrate. The solution is palatable, sweetish-acidulous.—Amer. Jour. Pharm., September 1886, 420–425.

Salicylic Acid—Precautions in Determination.—Mr. Frehse has made the interesting observation that in dilute solutions salicylic acid cannot be detected by ferric chloride after standing a certain time, and that under these conditions it has become decomposed. A solution of 0.01 gram salicylic acid in 1 liter of water was thus decomposed after three months, and when distilled water, distilled from water of the Rhône river, was used, the decomposition was even more rapid. On the other hand, it was quite possible to detect the acid dissolved in the above proportions, in wine after keeping the solution for several years. The author believes the preservation of the acid in this case to be due to the alcohol and acetic acid in the wine. The reaction is often more successful if the acid is removed from the wine by agitation in ether. The solution of ferric chloride, also, should be as dilute as possible, stronger solutions having a tendency to destroy the violet color of the reaction.—Arch. d. Pharm., Jan. 1887, 89–90; from Jour. de Pharm. et de Chim., 1886, xiv, 507.

Salicylic Acid—Determination in Wine.—Taffe draws attention to the fact that in shaking wine with ether for the purpose of removing and identifying salicylic acid, the ether is liable to dissolve with water and alcohol, a series of other bodies that are liable to interfere or cover the color reaction of the acid with iron. He suggests that instead of using pure ether, a mixture of this with an equal volume of petroleum ether be employed, thereby excluding water, etc., completely.—Arch. d. Pharm., May 1887, 414; from Journ. de Pharm. et de Chim., 1887, xv, 162.

Salicylate of Sodium—Preservation.—The following observations respecting the preservation of salicylate of sodium are made in "Nouveaux Remèdes" (ii, 379): If crystallized or powdered salicylate of sodium is placed in a glass vessel and exposed to the light for about 4 or 6 weeks, it darkens, loses its acid reaction and forms dark solutions, whilst the same, protected from light, remains colorless and preserves its reaction. Salicylate of sodium is also affected by moisture; when kept in perfectly dry bottles and sheltered from light no change is produced, but when kept in paper it soon becomes gray and inert. Solutions of salicylate of sodium made with spring-water soon darken, but when made with distilled water no change occurs.

Salicylate of Iron—Value in Infantile Diarrhœa.—Dr. Braithwaite gives this salt in infantile diarrhœa accompanied by fetid stools. The solution of the salt is prepared extemporaneously by dissolving separately in water 20 grains each of ferrous sulphate and sodium salicylate, mixing the solutions, adding 3 or 4 drachms of glycerin, and diluting with water to 3 fluid ounces. This is given in hourly doses of a teaspoonful until the stools become black, when the same dose is repeated every three or four hours.—Amer. Jour. Pharm., Nov. 1886, 534; from Brit. Med. Jour., July 17, 1886.

Zinc Salicylate—Commercial Quality.—Zinc salicylate is coming into use in medicine, and is prescribed in the form of solution in water. Of two commercial samples examined by F. H. Alcock, one was fairly soluble in warm water, crystallized on cooling in long needles, and when incinerated at as low a temperature as possible, emitted an agreeable odor, assumed a pink color, and finally left 20.8 per cent. of oxide of zinc. The other sample was less freely soluble in warm water, leaving behind a white powder, the filtrate crystallizing in needles; on incineration the salt did not give off the same peculiar odor, became black, and left 25.3 per cent. of zinc oxide. Formulas for this and other salicylates will be found in Proceedings 1886, 588.—Pharm. Jour. and Trans., Sept. 18, 1886, 226.

Salol—A New Antiseptic.—Mr. John Moss gives a description of the chemical characters and uses of a new antiseptic which was first introduced at a meeting of the Medico-Pharmaceutical District Society of Berne in April, 1886. Mr. Moss describes salol as a white crystalline powder, having the appearance of damp table-salt. The odor is very marked, and is identical with that of oil of wintergreen. When taken into the mouth, a fainter impression of the smell is received in the palate, and the taste of carbolic acid is just suggested. It is very sparingly, if at all, soluble in water at 60° F. It dissolves in proof spirit, more readily in stronger spirit, and is precipitated on dilution with water, a permanent emulsion being formed. The solution has no effect on litmus. It melts at 106°–108° F., forming at a slightly higher temperature a clear white liquid like carbolic acid, and if melted under water, and shaken until cool, the original condition of a coarse crystalline powder is restored. It dissolves readily in solution of soda, and on addition of acid in excess the liquid becomes milky, oily-looking drops are visible, and the smell of carbolic acid is noticeable.

Salol is stated to be a compound of salicylic acid and phenol, but the method of its preparation appears to be withheld. Mr. Moss has tried to produce it by dissolving salicylic acid in excess of carbolic acid, but failed to get all of the salicylic acid combined. He considers it probable that it is produced by decomposing the mixture of salicylate and carbolate of sodium—produced during a certain stage in the manufacture of salicylic acid—by hydrochloric acid.

Salol is claimed to have certain advantages over salicylate of sodium, for which it is proposed as a substitute. Also, that more carbolic acid may be injected as salol (Sahli, the originator, claims that salol contains 38 per cent. of phenol) than in any other way: the dosage being 30 grains 3 or 4 times a day.—Pharm. Jour. and Trans., Oct. 2, 1886. 273, 274; Yearbook of Pharm., 1886, 526–530.

Salol—Preparation by the Intervention of Phosgen Gas.—Dr. Hugo Eckenroth, remembering that phosgen gas has a similar reaction to that of pentachloride of phosphorus, hitherto employed in the preparation of salol, made a number of experiments with a view to utilizing the cheaper agent, and found it applicable to the preparation of salol. Molecular quantities of salicylate of sodium and phenate of sodium are intimately mixed, placed into a glass flask provided in the tubulure with a rubber stopper bearing two glass tubes, the one reaching nearly to the bottom and bent at right angles for the introduction of the gas, the other extending outward to the height of about two metres, to carry off the escaping vapors. Phosgen gas is admitted slowly, producing heat at first; but the reaction must shortly be aided by the heat of a water-bath, and is ended when a sample no longer separates phenol when mixed with water. The flask is then heated for about half an hour to expel the excess of phosgen gas; the mass remaining in the flask is treated with water to remove the chloride of sodium formed, and the residual salol is purified by repeated crystallizations from alcohol. When an alcoholic solution of salol is treated with bromine water, a white precipitate of

Bromsalol is produced. To prepare this compound, 10 parts of salol are dissolved in 50 to 60 parts absolute alcohol, and bromine water is added, in small portions at a time, awaiting the return of the liquid to a colorless condition, until the liquid remains permanently faint yellow. After standing about ten hours the liquid will again become colorless, and crystals of bromsalol will have separated. These are collected on a funnel, washed with a little alcohol, and recrystallized twice from that solvent. Bromsalol so obtained has the composition corresponding to the formula $C_{13}HgO_3Br$. It constitutes handsome, white, silky-glistening needles, melting at 98.5° C. It is insoluble in water, with difficulty in cold, but readily in boiling alcohol and ether.—Arch. d. Pharm., Nov. 1886, 928–931.

Cream of Tartar—Examination of Commercial Samples.—Mr. Claude H. Arnold has examined ten samples of cream of tartar from different drug stores, the pharmacopœial tests being used. Two did not contain any sulphate, and the remaining samples not an undue proportion of it. Chlorides were absent from seven and present to a limited extent in three samples. The same number showed the presence of iron, while seven samples gave no reaction with hydrogen sulphide in ammoniacal solution.

Eight samples contained less, and two indicated more than 6 per cent. of calcium tartrate.

Mr. Seth C. Johnson examined three samples purchased in drug stores and found them to be commercially pure, while of three samples purchased in grocery stores only one could be considered pure, the other two containing considerable amounts of calcium salt and starch.—Amer. Jour. Pharm., Dec., 1886, 593.

Citric Acid—Distinction from Tartaric and Malic Acids.—Mr. Méan recommends for the distinction of citric acid from tartaric and malic, that the sample be tested with 0.7 part of glycerin until acrolein vapor begins to form, then to dissolve the mass in ammonia, to evaporate the greater part of the latter by gentle heat. and to add 2 drops of dilute nitric acid (1:5). Under these conditions citric acid develops a green color, changing to blue by heat; the others do not produce this color reaction.—Archiv. d. Pharm., July, 1886, 637; from Journ. Pharm. Chim., 1886, 477.

Ferric Citrates—Preparation and Applicability to the Preparation of Certain Elixirs.—Mr. R. Rother reviews the subject of ferric citro-salts, in continuation and exemplification of a previous paper (see Proceedings 1883, 257–258). He particularly describes three preparations:

(1) *Officinal Ammonio-ferric Citrate.* This he recommends to be prepared by dissolving 272 parts of ferric citrate in 3 or 4 times its weight of water with heat, adding 79 parts of carbonate of ammonium, concentrating and sealing the solution in the usual manner. This salt is applicable for the simply ferrated elixir of cinchona.

(2) *Red Ferric Phospho-Citrate.* To prepare this compound, which forms a ferrated elixir of cinchona that does not precipitate on long standing. 816 parts of ferric citrate are dissolved as above, 237 parts of bicarbonate of ammonium are added, and, when effervescence has ceased, 358 parts of disodic phosphate are dissolved in the solution, which is then evaporated and scaled.

(3) *Green Ferric Phospho-Citrate,* which is preferred for some elixirs on account of its color, is obtained from 544 parts of ferric citrate, 79 parts of bicarbonate of ammonium and 358 parts of sodium phosphate.—Amer. Jour. Pharm., April 1887, 166–170.

Citrate of Iron and Quinine, Ph. Germ.—*Character and Tests of Quality, Etc.*—Dr. G. Vulpius draws attention to the fact that the formula of the German Pharmacopœia occupies a perfectly anomalous position in that it directs the preparation of the citrate of iron by the direct action of citric acid upon metallic iron, the resultant product being a mixture of ferrous and ferric citrate. This character of the compound would make it appear all the more important that the Pharmacopœia should direct proper tests of quality, which it, however, fails to give. With the view to establish proper characters of identity and quality, the author has prepared the compound in strict conformity with the pharmacopœial directions. He finds that 10 cc. of a solution of 1 part of the officinal compound in 50,000 parts of water gives, with 1 drop of a 10 per cent. solution of ferridcyanide of potassium a distinct blue color in the course of one minute, whilst this color is produced under the same conditions of time and quantity with ferrocyanide of potassium in a solution containing 1 part of the compound in 100,000. A small weighed portion of the compound heated in a crucible to complete decomposition, then moistened with a few drops of nitric acid, and again heated to redness, yields about 65 per cent. of residue. To determine that the proper degree of care has been exercised in preparing the quinine hydrate from the sulphate, it is sufficient to dissolve 0.1 gram of the compound in 4 cc. of water, and to add 4 drops of solution of nitrate of barium, which should not produce turbidity within 5 minutes. In order to determine the substitution of the compound by the preparation of the British or other pharmacopœias, a portion is tested for ammonia by heating with solution of potassa. The proper amount of quinine—which is 9 per cent., and consequently less than that of all other Pharmacopœias—may be approximately determined by adding 10 drops of volumetric iodine solution to 10 cc. of a solution of 1 part of the compound in 15,000 p. of water, when, within 5 minutes, a distinct turbidity will become evident.—Arch. d. Pharm., Nov. 1886, 967–970.

Citrate of Iron and Quinine, B. P.—Examination of Commercial Samples.—Mr. F. H. Alcock has examined six samples of commercial citrate of iron and quinine, represented to be typical representatives of the B. P., 1885, and obtained from well-known manufacturers. With a single exception they were all deficient in quinine, the exception containing fully 15 per cent. of alkaloid. The results are shown in the following table:

Sample.	Solubility.	Ferric oxide.	Alkaloid.	Sulphate, SO_3.
A . . .	Clear	18.2	14.7	0.875
B . . .	Turbid and flocculent	20.0	14.0	1.812
C . . .	Very clear	19.8	15.3	0.141
D . . .	Clear, but turbid on standing .	21.0	13.0	2.386
E . . .	Clear, but turbid on standing .	19.0	14.6	2.467
F . . .	Very turbid	16.4	14.0	1.704

As will be noticed, in some of the samples the amount of sulphuric acid present was almost as high as the amount required to convert the alkaloid formed into the normal sulphate, suggesting the idea that the sulphate had been added as such, and not the alkaloid. The advantage of the absence, as far as possible, of sulphate is shown by the sample C, which was in all respects the best preparation.—Yearbook of Pharm., 1886, 473–476.

Aconitic Acid—Preparation.—According to Mr. H. Hentschel, aconitic acid is best obtained as follows: 100 g. of crystallized citric acid are boiled for 4 to 6 hours with 50 g. of water, and 100 g. pure sulphuric acid, in a flask provided with a reverse condenser. On cooling a solid cake of aconitic acid results, which is mixed with fuming hydrochloric acid, transferred to an asbestos filter, and washed until completely freed from sulphuric acid. The aconitic acid remains in the filter in form of shining, perfectly white, four-sided crystalline plates.—Arch. d. Pharm., April, 1887, 357; from Journ. f. Prakt. Chem., xxxv, 205.

Jervic Acid—Identity with Chelidonic Acid.—During the course of an examination respecting the constituents of *Chelidonium majus*, Mr. Ernst Schmidt's attention was directed to the marked similarity of chelidonic acid with the jervic acid, discovered by H. Weppen in *Veratrum album* (see Proceedings 1873, 364). The similarity existed not alone in the appearance and reactions of the two acids, but their composition appeared also to be the same. The author now records a series of experiments, which completely proves the identity of the two acids. The observation is of particular interest, in that it shows the presence of an acid hitherto found only in a species of the *Papaveraceæ*, also in a monocotyledonous root of the *Veratreaceæ*. The yield of jervic acid was found by Weppen to be about 0.5 gram from a kilogram of root; the author found *Chelidonium majus* (herb) to yield 0.6 to 1 gram of chelidonate of calcium, corresponding to 0.43–0.73 gram of chelidonic (jervic) acid per kilo.—Arch. d. Pharm., 1886, 513–522.

Angelic Acid—Formation in Sumbul Root During the Process of Extraction.—Mr. E. Schmidt, wishing to make some investigations respecting the nature of angelic acid, selected sumbul as the material likely to yield the largest quantity, Reinsch and Rieckher (1848) having obtained from 5 pounds of sumbul root 2½ drachms of pure and 2 drams of impure angelic acid. For this purpose the sumbul was extracted with boiling carbonate of sodium solution, the concentrated solution supersaturated with sulphuric acid, and subjected to distillation. The distillate, however, failed to yield angelic acid, and, suspecting that the acid either does not pre-exist in the sumbul, or, at all events, only in minute quantities, he made further experiments which seem to prove that angelic acid is formed by the action of caustic potassa upon the constituents of the root (sumbul-balsam). Along with angelic acid the author also obtained a quantity of the isomeric acid,

Methyl-Crotonic Acid.—This latter, it is probable, is formed by continued boiling from the angelic acid, though, on the other hand, the action of the alcoholic solution of potassa upon the sumbul-balsam may result in the formation of the one acid or the other, according to the conditions of the reactions.—Arch. d. Pharm., 1886, 528–531.

Chelidoninic Acid—Identity with Aethylene-Succinic Acid..—About 25 years ago C. Zwenger described an acid, distinct from chelidonic acid, which he had obtained along with the latter from *Chelidonium majus*, and which he named chelidoninic acid. The existence of this acid has been doubted by different experimenters, some of whom had obtained acids identical or similar to succinic acid, when following the process pursued by Zwenger. Mr. Ernst Schmidt has now reinvestigated the subject, and has obtained results which leave little room for doubt that Zwenger's chelidoninic acid is identical in all respects with aethylene-succinic acid. The crystalline form of the two acids, their solubilities, behavior towards ferric chloride and other reagents, are absolutely identical.—Arch. d. Pharm., 1886, 531–534.

Tragoponic Acid.—A new acid from *Tragopogon porrifolius*, which see under "Materia Medica."

Pipitzahoïc Acid—Characters, etc.—Messrs. R. Anschütz and J. W. Leather have comprehensively studied the character of pipitzahoïc acid (see Proceedings 1884, 149 and 150). They obtained from the dried roots of *Trixis Pipitzahuac* an average of 3.6 per cent. of the acid, which melts at 103–104°, sublimes readily, and is easily soluble in alcohol, ether, chloroform, benzol, and glacial acetic acid. The authors confirm the formula given to the acid by its discoverer, Weld (1855), viz.: $C_{15}H_{20}O_3$. It is a quinon, and bears great resemblance, when recrystallized from diluted alcohol, to oxythymoquinon recrystallized from the same liquid, being scarcely distinguishable from this.—Arch. d. Pharm., Feb. 1887, 183; from Liebig's Annalen, 237, 90.

Maizenic Acid.—Characters, etc., as obtained from *stigmata maydis*, which see under "Materia Medica."

Glycosuric Acid—A New Acid in Urine.—Dr. John Marshall draws attention to a new acid which he has succeeded in separating from a specimen of urine, and which possesses the remarkable property of reducing Fehling's as well as Trommer's solution, strongly resembling in this respect the reducing action of glucose, though differing from the latter in its other reactions. On account of its power to reduce alkaline cupric solution the author proposes for the new substance, which for want of further material has not been subjected to ultimate analysis, the name glycosuric acid. The method for its isolation was as follows: The urine was treated with half its volume of plumbic tribasic acetate solution, and the resulting voluminous precipitate collected on a filter and washed several times with a mixture of equal parts of alcohol and water. The precipitate was then suspended in warm water and hydrogen sulphide passed through until all the lead was precipitated. After expelling the hydrogen sulphide from the filtrate by boiling, excess of plumbic carbonate was added, and the liquid was gently boiled several minutes, and then filtered while hot.

The filtrate was concentrated on the water bath and then kept in a cool place to allow crystallization to occur. The crystals of the lead salt which separated were washed by decantation with a mixture of equal parts of alcohol and water and recrystallized from hot water. Finally, when sufficiently pure they were dissolved in hot water and the lead precipitated by hydrogen sulphide, filtered, and the filtrate containing the free acid evaporated to dryness at about 70° C. The residue was extracted with ethyl ether, and the latter evaporated spontaneously. Several recrystallizations from ether, the final one from a mixture of ether and water, are necessary to obtain the acid in a fairly pure condition. The crystal mass was pressed between bibulous paper and again recrystallized from water.

The acid thus obtained crystallizes in opaque white tetragonal prisms, melts at 140° C., and sublimes in the same prismatic form, the crystals generally radiating from a centre. It is very soluble in water and in ethyl ether, soluble in absolute alcohol and also in ordinary alcohol, sparingly soluble in chloroform, insoluble in benzol, toluol, and in petroleum ether.

When its solution in ethyl ether is evaporated at a temperature of about 60° C., a slight claret-red tint is produced, which soon resolves into spots of purple. This purple substance (somewhat resembling murexide) attaches itself to the crystalline mass, producing a very beautiful appearance. The crystals, including the purple substance, dissolve in water, with a disappearance of the purple coloration. In the spontaneous evaporation of the aqueous solution of the acid no change of color is noticed.

The author gives the reactions of the new acid, which indicate that it is most likely a phenol derivative. It forms lead, barium, and calcium salts, and contains neither sulphur nor nitrogen. He considers it quite likely that the new acid may occur more frequently in urine than is suspected, probably only in less quantity than contained in the urine examined by him, and to its presence possibly may be attributed the many peculiar and unsatisfactory reactions so often noticed when testing urine with Fehling's solution.—Med. News, Jan. 8, 1887, 35.

Calcium Hippurate—Medicinal Uses, etc.—This salt is highly recommended by Poulet in the uric acid diathesis, and is stated to be useful in scrofulous complaints, incipient cirrhosis of the liver and in struma. The dose is 10 grains. For the preparation of the salt, Liebig recommended the aqueous solution of hippuric acid to be heated with calcium carbonate; the filtrate yields on concentration, glossy scales or oblique rhombic prisms, which have the composition $Ca(C_9H_8NO_3)_2.3H_2O$, are soluble in 18 parts of cold and 6 parts of boiling water, and lose at 100° C., the water of crystallization, amounting to 12 per cent.

Dr. Dujardin-Beaumetz (*Union Méd.*, August, 1866), orders the salt extemporaneously prepared by dissolving 1 part of hippuric acid in 25 parts of lime water and adding an equal bulk of syrup; the dose is a tablespoonful.—Amer. Jour. Pharm., Nov. 1886, 534.

Oak-wood Tannin—Characters, etc.—Mr. Carl Bottinger has examined a partially pure tannin which occurs in commerce under the name of oak-wood tannin. It constitutes a thick, brown, semi liquid mass, which forms with water a brown solution and a yellowish-grey powdery residue remains undissolved. Bromine does not occasion a precipitate, whereby the tannin of oak-wood is distinguished from the bark tannins and resembles ordinary tannin. By evaporating the solution and treating the residue with glacial acetic acid, an acetyl compound of the oak-wood tannin enters into solution, and is precipitated from this by pouring the solution in water, under stirring, as a light, greyish-white, heavy powder. The aceto-oak-wood tannic acid, when dried in an exsiccator, has the composition corresponding to the formula $C_{15}H_7(C_2H_3O)_5O_9$. It is insoluble in water, in ether, or in alcohol, but easily dissolved by acetic ether, glacial acetic acid, acetone and chloroform. By heating in a closed tube to 135° it is converted into oak-wood tannic acid, which has the composition $C_{15}H_{12}O_9 + 2H_2O$. This acid constitutes a light-brownish powder, is hygroscopic, and dissolves readily in water and in alcohol.—Arch. d. Pharm., June 1887, 542; from Liebig's Annalen, 238, 366.

Tannic Acid—New Test.—A remarkably delicate test for sugar has recently been submitted to the Austrian Academy of Sciences. Mr. J. E. Saul finds that the reaction affords a good method for distinguishing gallic acid from tannic acid, the test being applied as follows: Agitate about 0.01 gm. of the sample with 3 cc. of water; add 3 drops of 20 per cent. alcoholic thymol solution, and then 3 cc. of strong sulphuric acid. Tannin under these conditions yields a turbid rose-colored solution; gallic acid remains untinted, or only developes the faintest possible pink coloration. The reaction is doubtless due to the variable proportion of combined grape sugar in commercial tannin.—Phar. Jour. and Trans., Nov. 13, 1886, 387.

Tannic Acid—Value in Tuberculosis.—Messrs. Raymond and Arthaud have made some comparative researches on the action of sulphide of carbon, iodoform, and tannic acid in tuberculous patients. Having found that when tannin had been administered to animals for a month, they were more refractory to the effects of the tubercular virus, it was used in more than fifty cases of tuberculosis in doses of from two to four grammes daily. In less than a fortnight half of the patients showed an increased weight, which continued during the treatment. In acute tuberculosis, both of the child and the adult, the symptoms amended, and the disease retrograded in some cases which had been looked on as hopeless. —Quart. Therap. Rev., 1887, 9.

Gallic Acid—Solubility in Water.—Mr. D. B. Dott has determined the solubility of gallic acid to be one part in one hundred and eighteen parts of water at 16° C.—Phar. Jour. and Trans., May 21, 1887, 941.

ORGANIC BASES.

Alkaloids—Titration by Mayer's Reagent.—Dr. A. B. Lyons communicates the results of an extended series of experiments made to determine in how far, or under what conditions, titration by means of Mayer's reagent is a reliable means of quantitatively estimating alkaloids. In a paper published some twenty years ago (Phar. Jour. and Trans., ii, 6, 268), Mr. Thomas B. Groves pointed out the circumstance that in titrations with Mayer's solution a point would be reached before precipitation ceased when the filtered fluid would cause a precipitate in a fresh solution of the alkaloid, showing the presence already of an excess of the precipitant. Mr. Groves observed that in some instances this apparent excess after a time disappeared, showing that the reaction is not instantaneously completed, or possibly that an intermediate soluble compound is first formed, which subsequently takes up a larger proportion of the alkaloid, frequently producing in this manner distinctly crystallized compounds. Dr. Lyon's observations, made at first in ignorance of Mr. Groves' paper, are confirmatory of the earlier ones. He found that in the case of some of the alkaloids, the solution would begin to show apparent excess of reagent when scarcely half the quantity had been added necessary for complete precipitation. The larger the quantity of fluid present, the larger the amount of this excess, which, it seems, must form a definite proportion of the entire fluid.

The practical deduction from this observed fact is, that the titration equivalent of any given alkaloid varies with the degree of dilution of the solution. If it is fixed, *e. g.*, for a solution of 1 : 200, a correction must be made in titrating more dilute solutions, *not additive, as most writers represent, but subtractive.* The results of the author's experiments are given in the following tabulated statement. In all the experiments the Mayer's reagent used was 1–20 normal, *i. e.*, one-half the strength of the original Mayer's solution. Two modified forms of the reagent were prepared, No. 1 containing 5 molecules instead of 3 of potassium iodide, No. 2 containing barely enough potassium iodide to hold in solution the mercuric iodide. The quantity of mercury in all was the same, and in each experiment 0.10 gram of alkaloid was used. When not otherwise stated, the titrations were made in presence of a little free sulphuric acid, about 1 minim of 6 per cent. acid to each cc. of fluid titrated.

Name of alkaloid, 0.100 used in each experiment.	Especial conditions.	Proportion of alkaloid in solution titrated.	Mayer's Solution, 1-20 Normal.					
			Required to give apparent excess.	Added, giving large excess.	Produces only slight precipitation.	Required for complete precipitation.	Excess at end of titration.	Actually consumed.
Aconitine (Merck's cryst.)		1:200			6.2	7.3†	2.2	5.1
Aconitine, crude from Aconite root.		1:200	3.3		6.0	6.25		
“ “		1:400	3.5		5.9	6.3		
Atropine		1:200		8.		13.1	3.0	10.1
“		1:200		7.1		14.9††	4.3	10.9
“		1:200		7.0		13.6	4.0	9.6
“		1:400	5.2			14.0†	3.5	10.5
“		1:600		7.6		15.0	5.6	9.4
“	Modified reagent No. 1.	1:200	5.5			11.2	2.8	8.4
“	“ “ “	1:400		8.		11.6	3.2	8.4
“	“ “ “	1:600		7.2		10.8	2.6	8.2
“	Modified reagent No. 2.	1:400				12.9†		
Berberine		1:200				3.7	0.2	3.5
“		1:400				3.8		
“		1:600				4.2 to 4.6		
“	Modified reagent No. 1.	1:200				3.8		
“	“ “ “	1:400				3.8		
“	Modified reagent No. 2.	1:400				6.0 to 7.2		
Brucine (Commercial.)	Sol. slightly acid.	1:200			7.6	8.0†	1.7	6.3
“	Sol. nearly neutral.	1:200	5.1		6.4	6.9	0.9	6.0
“	“ “ “	1:400		6.8	8.4	8.8		
“	Sol. quite neutral.	1:400	6.0		7.6	8. to 9.2†		
“	Sol. moderately acid.	1:400			8.0	9. to 9.8†		
“	Sol. nearly neutral.	1:600	6.0			9.2†		
“	Mod. reagt. No. 1.	1:200		4.8		6.	1.3	5.7
“	“ “ “	1:400		6.	7.2	7.6		
“	KI, 0.8 added.	1:400		4.8		6.8		
“	“ “ “ †	1:400			5.2	5.6§		
“	25 per cent. alcohol present.†	1:400		5.8	8.	9. to 10.*		
“	“ “ “	1:400		6.4	10.	11.2†		
Brucine (Merck's pure)	Sol. faintly acid.	1:400			9.6	10.0		
“	Sol. neutral.	1:400			11.6	?†		
“	“ “ 25 per cent. alcohol present.	1:400			12.0	13.2†		
“	Sol. acid, 25 per cent. alcohol present.	1:400			11.2	11.6†		
Cinchonidine		1:100	12.4			13.8	1.0	12.8
“		1:200	11.2			15.6	2.6	13.0
“		1:200				13.5	0.7	12.8
“	Mod. reagent No. 1.	1:200				12.3*		
Cinchonine	Sol. quite neutral.	1:200	7.9			10.8		
“	Sol. quite acid.	1:200		12.8		14.2		
“	Sol. strongly acid.	1:200	12.0		17.4	19.4†		
“	Sol. neutral.	1:400	8.0			12.4	2.4	10.0
“	Sol acid.	1:400	10.0			14.0		
“	Sol strongly acid	1:400	11.5			14.0*		

Name of alkaloid. 0.100 used in each experiment.	Especial conditions.	Proportion of alkaloid in solution titrated.	Mayer's Solution, 1-20 normal.					
			Required to give apparent excess.	Added, giving large excess.	Produces only slight precipitation.	Required for complete precipitation	Excess at end of titration.	Actually consumed.
Cinchonine.	Mod. reagent No. 1	1:200	7.0			8.4		
"	" "	1:400	7.1			9.4	0.8	8.6
"	" " sol. acid	1:400	8.8		12.4*	16.0††	3.6	12.4
"	Mod. reagent No. 1. 25 per cent. alcohol.	1:400	6.2			11.6		
Cocaine.		1:25				9.0		
"	Sol. neutral	1:200	7.2			9.7	0.7	9.0
"	Sol. acid	1:200				10.6	1.1	9.5
"	" "	1:200				12.1*		
"	" "	1:300			12.4	13.2*		
"	" "	1:400	10.0		12.8	14.4	4 6	9.8
"	Sol. nearly neutral.	1:400				15.2		
"		1:600		14.0		16.0†	5.2	10.8
"		1:600			14.8	15.2		
"	Mod. reagent No. 1	1:200	8.		9.2	9.6		
"	" "	1:200				11.2	1 8	9.4
"	" "	1:400		11.2	12.0	14.4	4.1	10.3
"	2 per cent. KI present.	1:200			9.2	11.3†		
"	8 per cent. KI present.	1:300			9.6	11.2†		
"	3 per cent. KI present.	1:600			12.8	14.4		
"	4 per cent. KI present.	1:600			11.6	13.2		
"	5 per cent. KI present.	1:600			10.8	12.8		
"	Mod. reagent No. 2.	1:200				12.2	1.6	10.6
"	20 per cent. alcohol present.	1:400				14.5		
"	20 per cent. glycerin present.	1:400				13.4		
Colchicine (Merck's)		1:300			9 2	10.1 to 11.0†		
"	Mod. reagent No. 1	1:400	2.5		8.0	9.2†		
Colchicine (Crude from colchicum seed.)		1:200	3.2			9.2		
"		1:300	4.0		9.0	10.2		
"		1:400		6.	9.6	10. to 12.†		
"		1:600		5.	8.6	11.5to12.5†		
"		1:800	4.0		12.6	14. to 15.†		
Emetine		1:200	8.0		8.8	9.2 to 9.8		8.8
"		1:400	8.5		10.0	10.2	1.0	9.2
"		1:600	9.2			10.6	0.6	10.0
"	Mod. reagent No. 1	1:300				9.4	0.6	8.8
"	Mod. reagent No. 2	1:300				11.2†		
Gelsemine	Sol. faintly acid	1:200		5.8	9.6	10.0		
"	Sol. acid	1:200	3.8		9.8	10.4		
"	Sol. more acid.	1:200	3.8		10.2	10.8		
"	Sol. faintly acid.	1:400		8.0	9.6	11.2 to 12.0†		
Hydrastine		1:100				7.2		
"		1:200				7.4		
"		1:300				7.8		
"		1:400				8.2		
"		1:600				8.4		
Hyoscyamine (Merck's cryst.)		1:200				9.2		
"	Mod. reagent No. 1	1:200		6.8	8.3	8.5 to 9.1†		6.7
Morphine	Sol. neutral.	1:200			6.6	7.8		

Name of alkaloid. 0.100 used in each experiment.	Especial conditions.	Proportion of alkaloid in solution titrated.	Mayer's solution, 1–20 normal.					
			Required to give apparent excess,	Added, giving large excess.	Produces only slight precipitation.	Required for complete precipitation.	Excess at end of titration.	Actually consumed.
Morphine	Sol. acid	1 : 200			7.0	8.6		
"	Sol. neutral	1 : 400			6.9	9.1†		
"	Mod. reagent No. 1	1 : 200				8.8	0.6	8.2
Pilocarpine		1 : 200	4.8			18.8		
"		1 : 200				19.4	2.3	17.1
"	Titrated without filtration	1 : 200			16.4 ††	21.4†	1.4	20.0
"	Mod. reagent No. 1	1 : 200	9.		14.0	15.2	1.6	13.6
"	" " "	1 : 200			13.6	14.3 ††	1.4	12.9
Quebracho alkaloids		1 : 200				8.2 to 8.6		
"	Sol. slightly acid	1 : 400				9 6		
"	Sol. more acid	1 : 400				10.4	1.0	9 4
"	Sol. slightly acid	1 : 600				11.2		
Quinine		1 : 200	8.8		14.0	15.5	2.7	12.8
		1 : 400		12.8		16.8		
	Sol. neutral	1 : 400	11.6		15.1	16.0	3.4	12.6
	" acid	1 : 400	12.0		16.0	18. to 19.†		
	Mod. reag't No. 1 neutral	1 : 400		10.5		12.5		
	Mod. reag't. No. 1 acid	1 : 400	12.6			13.0††		
	Mod. reag't. No. 1 strongly acid	1 : 400	13.††			19.§		
	Mod. reag't. No. 1, 25 per cent. alcohol.†	1 : 400	9.5			12.4††		
Strychnine	Sol. neutral	1 : 200	11.2		12.2	14.0		
	Sol. acid	1 : 200				11 0	0.6	10.4
	" more "	1 : 200	11.0		11.4	11.8	0.3	11.5
	" neutral	1 : 400	11.4 ††			12.0*		
	" acid	1 : 400				11.6†		
	" more "	1 : 400	11.4		12.0††			
	Mod. reag't. No. 1	1 : 200	10.4		11.6	12.8		
	" " "	1 : 400	11.2		11.6	13 6		
	Mod. reag't. No. 1 acid	1 ; 400	11.2			12 0		

† End of reaction not well defined.

†† Modified reagent No. 1.

§ Precipitate forms of crystals.

* Precipitate forms and redissolves, more reagent again producing precipitate.

The author's paper concludes with a series of special observations on individual alkaloids, for which reference may be had in Amer. Journ. Pharm., Dec. 1886, 579–587, or in Proceedings Mich. State Pharm. Assoc., Oct. 1886.

In continuation of the above researches, Dr. Lyons records some further observations, relating particularly to the most advantageous method of employing Mayer's solution. After considering the manipulation necessary to accurate titration, the author suggests that possibly Mayer's reagent may be used for a gravimetric method. With the view to paving the way for such a method, he has made a series of experiments, the results of which are presented in a tabulated statement, as follows:

Name of Alkaloid.	Weight. of prec. containing 100. alkaloid.	Average weight of alkaloid in 100. of prec. approx.	Weight of prec. analyzed.	Hg. in prec. analyzed.	Atoms Hg.	I. in prec. analyzed.	Atoms I.	Molecular weight of prec.
Aconitine	179–188	54.8	182.5	27.5	0.73	55	2.35	954–1002
Atropine	216–245	54.4	220	51	0.73	69	1.6	624–708
Berberine	200	55.0	. . . .	25	0.42	75	2.0	670
Brucine	190–214	48.9	205	30	0.59	75	2.33	749–843
Cinchonidine	348–370	28 5	352	60	0.92	192	4.65	1072–1140
Cinchonine	324–348	30.0	339	62 5	0.96	176.5	4.28	988–1072
Cocaine	240–270	40.7	246	50	0.76	94	2.25	. . . . .
Colchicine	155–180	. . . .	159	34	0.58	25	?	491–571
Emetine	240–256	40.8	245	44	1.09	105	4.10	1190–1270
Gelsemine	185–200	52.4	. . . .	50	1.02	50	1.61	816
Hydrastine	200–210	47.6	210	37	0.73	73	2 28	834
Hyoscyamine	222–250	43.5	228	46	0.66	82	1.87	642–7
Morphine	190–204	48.6	202	42	0.60	60	1.35	541–5821
Pilocarpine	295–340	. . . .	308	81	0.84	127	2.08	614–707
Quinine	310–335	30.8	325	64	1.04	161	4.11	1001–1085
Strychnine	258–274	37.9	264	57	0.95	107	2.81	860–913

The author finds that most o the precipitates vary considerably in weight under varying conditions. The weight of the precipitate often increases materially if it is allowed to stand some hours before collecting. In most cases the precipitates were collected shortly after they were formed, on a pair of mutually counterpoised filters, washed slightly with water, pressed strongly between folds of blotting paper, dried at 100° C. and weighed. Some of the precipitates bear washing fairly well. Most of them begin to dissolve as soon as excess of Mayer's reagent is no longer present. If the washing is continued, a precipitate begins to form in the washings, showing that the water is carrying through some of the alkaloid, the precipitate being either decomposed or dissolved. By using moderately dilute solutions, however, and washing the filters rather than the precipitate, results were obtained which are believed to be reasonably near the truth.

The precipitates were analyzed in the following manner: They were dissolved in alcohol, ammonium sulphide was added in slight excess, and the mercuric sulphide was collected, dried and weighed. The solution was then treated with a drop or two of solution of ferric sulphate to precipitate the excess of sulphur, filtered, and the iodine estimated volumetrically with silver nitrate. In a few instances the silver iodide was also collected and weighed, the result generally coinciding with that obtained by titration, although in some cases it seemed probable from the discrepancy in weight that the precipitate contained chlorine as well as iodine.

The author concludes from his above results that in the case of the cinchona alkaloids, emetine, and possibly gelsemine, the precipitate contains one atom of mercury for each alkaloidal molecular group, and that a few only of the precipitates approximate a composition assigned them by Prof. Mayer. But the question of most consequence is whether precipitates produced by Mayer's reagent are of so constant a composition as to be available for purposes of gravimetric estimations. With a few exceptions, he believes that where approximate results only are contemplated, they are thus available. When they are to be used in this way, they must be produced by adding at once sufficient reagent to precipitate the alkaloid completely, with a small margin of excess. The precipitate must be allowed to stand several hours before it is collected. It will not bear much washing. Sometimes it will adhere firmly to the beaker. When this is the case it may be washed once or twice superficially with water, dried in the beaker, and weighed. Otherwise it can be best collected on a pair of mutually counterpoised filters, washed with a little water, so applied as to wash the filters rather than the precipitate, pressed between folds of filter paper, dried at 100° C., and weighed.—Amer. Jour. Pharm., Jan. 1887, 1–7.

Alkaloids—Forensic Determination.—Mr. H. Beckurts has delivered a lengthy address before the fifteenth general meeting of the German Apothecaries' Association, in which he critically reviews the methods at present in use for the determination of poisonous alkaloids in forensic cases, taking the recent investigations respecting the ptomaines particularly into consideration. He concludes, after his elaborate statements respecting the character of the processes concerned, as well as of the natural alkaloids and ptomaines or alkaloids resulting from processes of decomposition, that the present processes for the isolation of alkaloids are not sufficient for their indisputable determination. The principal sources of error are: the possibility of mistaking the ptomaines and other decomposition products of the albuminoids for plant alkaloids, and the possibility of these artificial products masking the reactions properly belonging to the natural alkaloids.

Under existing circumstances he regards it as best to make acidulated alcoholic extractions of the proper parts and organs of the cadaver; to precipitate the alkaloids and, if present, ptomaines, from this solution as double salts; to separate from these the peptones and albuminates, precipitated with them, by appropriate means; then to decompose the double salts, and to extract the alkaloids, resp. ptomaines, from these pure solutions in the usual manner by the proper solvents.—Arch. d. Pharm., Dec. 1886, 1041–1065.

Alkaloidal Salts—Volumetric Determination of Acid.—Prof. P. C. Plugge records a number of experiments made with a view to determine the possibility of volumetrically estimating the amount of acid contained in alkaloidal salts. He finds:

(1) That in the salts of the weak opium bases, narcotine, papaverine, and narceine, the amount of acid can be volumetrically estimated with either litmus or phenolphthalein, the reaction being as precise and well defined as if no alkaloid were present.

(2) That by the use of phenolphthalein the acid can be readily determined in the salts of alkaloids in general, with the exception of those of the volatile alkaloids—coniine and nicotine—and with certain restrictions also as to codeine, brucine, morphine and thebaine.

(3) That the free acid in solutions of alkaloidal salts—excluding those of the weak opium bases—can be determined by the aid of litmus; the entire quantity of acid by titration with phenolphthalein. The difference in these two determinations gives the quantity of acid united to the base, consequently also the quantity of alkaloid.

The author observes that the facts laid down above are applicable to many examinations, particularly to such relating to the purity of alkaloidal salts, and he gives a number of examples of this application, for which, as well as the details of his experiments, reference must be had to the original paper in Arch. d. Pharm., Jan., 1887, 45-59.

Opium Alkaloids—Action of Alkalies in Combination with Certain Organic Acids.—Prof. P. C. Plugge has contributed a lengthy paper in which he records experiments made with a view to determine the action of certain alkaline salts of organic acids upon the principal opium alkaloids. The alkaloids experimented upon, and the purity of which had been established, were: morphine, codeine, thebaine, papaverine, narcotine and narceine. The salts of organic acids experimented with were: the acetates of sodium and ammonium; oxalate of ammonium; salicylate of sodium; tartrate of potassium; benzoate of sodium, and hydrocarbonate of sodium. He finds that *narcotine*, *papaverine* and *narceine* are precipitated from their solution by solutions of each and any of the above named salts; only *thebaine* is precipitated by salicylate and by carbonate of sodium; whilst morphine and codeine are precipitated by none of the salts enumerated. The author also records experiments made to determine the alkaloids quantitatively, both by themselves and in admixture, for which reference must be had to his paper, in Arch. d. Phar., Dec. 1886, 993-1014.

Opium Alkaloids—Method of Separation.—On the basis of his above described observations respecting the action of certain salts upon the alkaloids of opium, Mr. P. C. Plugge has worked out a complete method for their separation, which is given in the following:

The Mixture of Opium Alkaloids contains Narcotine, Papaverine, Narceine, Thebaine, Codeine and Morphine.

The solution is mixed with a sufficient quantity of concentrated solution of acetate of sodium. After standing for at least 24 hours, it is filtered, and the precipitate washed with a little water.

<table>
<tr>
<td colspan="2" rowspan="2"><i>Precipitate</i>
is composed of <i>Narcotine</i> and <i>Papaverine.</i>
It is dissolved in dilute HCl, the solution diluted somewhat with water so as not to contain more than $\frac{1}{100}$ Narcotine, and mixed with a solution of $K_6Fe_2Cy_{12}$. After standing for 24 hours the precipitate is filtered and washed with a little water.</td>
<td colspan="4"><i>Filtrate</i>
Contains—<i>Narceine, Thebaine, Codeine</i> and <i>Morphine.</i>
The liquid, containing Acetate of Sodium in excess, is evaporated to a small volume, allowed to stand 24 hours, and the precipitate collected and washed.</td>
</tr>
<tr>
<td rowspan="3"><i>Precipitate</i>
is composed of <i>Narceine,</i> which is perfectly pure.</td>
<td colspan="3"><i>Filtrate</i>
Contains besides traces of Narceine, the <i>Thebaine, Codeine</i> and <i>Morphine.</i> It is mixed with a sufficient quantity of Salicylate of Sodium. After 24 hours the crystalline precipitate is collected on a filter and washed with little water.</td>
</tr>
<tr>
<td rowspan="2"><i>Precipitate</i>
is composed of <i>Ferrocyanide of Papaverine.</i>
To separate the papaverine from this, it is digested with dilute soda solution, washed, if necessary dissolved in HCl, and precipitated as pure <i>papaverine.</i></td>
<td rowspan="2"><i>Filtrate</i>
contains the <i>Narcotine.</i>
This is obtained from the solution by precipitation with NH_3, washing with water, and drying.</td>
<td rowspan="2"><i>Precipitate</i>
is <i>Salicylate of Thebaine,</i> from which the thebaine is obtained pure by washing it upon the filter with diluted NH_3 until the washings no longer evidence salicylic acid by Fe_2Cl_6.</td>
<td colspan="2"><i>Filtrate</i>
Contains beside remnants of Salicylate of Sodium, Narceine and Thebaine, all the <i>Codeine</i> and <i>Morphine.</i>
The liquid is acidulated with HCl, filtered after standing to remove salicylic acid, shaken repeatedly with chloroform to remove remaining salicylic acid, thebaine and narceine, the chloroform driven off by gentle heat, carefully neutralized, and sulpho cyanide of potassium added, and allowed to stand 24 hours.</td>
</tr>
<tr>
<td><i>Precipitate</i>
is composed of <i>sulpho-cyanide of codeine.</i></td>
<td><i>Filtrate</i>
contains <i>Morphine,</i> which is obtained by adding ammonia in excess.</td>
</tr>
</table>

—Arch. d. Pharm., April 1887, 343–354.

Morphine—New Method of Determination in Opium and its Preparations.—Mr. O. Schlickum recommends a new method for the determination of morphine in opium, which is a modification of that of Mr. E. Dieterich, and is based upon the circumstance that morphine, in solutions containing alcohol, is capable of decomposing the ammonia salts present. The ammonia liberated by the morphine is then evaporated, together with the alcohol, and a neutral watery solution is obtained containing the morphine to the exclusion of all other substances precipitable by ammonia. The method admits of slight variations as applied to the opium, the extract, and the tincture, and as applied to these is as follows:

A. Assay of Opium.

3.0 gram of opium are digested with frequent skaking in a close flask for twelve hours, with a mixture of 15 grams of diluted alcohol and 15 grams of water. The filtrate is weighed, treated with a few drops of ammonia to faint alkaline reaction, and evaporated to one half its original weight, and then filtered. 21.25 grams of this filtrate are mixed with 5 grams of ether and 0.4 gram ammonia, and the mixture is occasionally shaken during 5 or 6 hours. The ether is removed as completely as possible with a pipette, and the morphine is collected on a small double filter—the one to serve as counterpoise for the other—washed twice with 2 cc. of water, dried and weighed. The yield should not be less than 0.20 gram.

B. Assay of Extract of Opium.

1.5 grams of extract of opium are dissolved without heat in a mixture of 10.5 grams of diluted alcohol and 10.5 grams of water. The carefully weighed filtrate is treated with ammonia to faint alkalinity, boiled until reduced to one-half its weight, then brought to its original weight by water, and filtered. 15 grams of this filtrate are then treated with 5 grams ether and 0.4 ammonia precisely as under *A*. The yield should not be less than 0.17 gram.

C. Assay of Tincture of Opium.

25 grams of the tincture are rendered alkaline with ammonia, boiled to one-half, brought to the original weight with water, and filtered. 20 grams of the filtrate are treated with the same quantities and in like manner with ether and ammonia. The yield should be at least 0.19 gram.—Arch. d. Pharm., Jan. 1887, 13–32.

In a subsequent paper (Ibid., June 1887, 483–493), the author gives in tabulated form the results of the experiments upon which his above method is based.

Morphine—Estimation by the Process of the B. P., 1885.—Messrs. J. Oldham Braithwaite and E. H. Farr communicate the results of some experiments which tend to show that the long period of maceration of the liquor after the addition of ammonium chloride (12 hours) directed is not necessary. The authors obtained results which were practically identical by macerating for two hours only. The author also made some experiments to determine what relation existed between the product obtained by the process and pure morphine. He finds, that while the amount of impurity (coloring matter) is somewhat variable, the average amount of impurity in the morphine may be taken at 7 per cent. As a rule morphine from tinct. opii is darker than that from extract or powder, and contains, in the case of the sample examined by the author, about 10 per cent. of coloring matter. Pharm. Jour. and Tran., Nov. 13, 1886, 398–399.

Morphine.—Ready Method of Assay in *Laudanum*, which see under "Pharmacy."

Morphine—New Reactions.—Mr. J. Donath draws attention to the following reactions of morphine: About a milligram of powdered morphine is intimately mixed with eight drops of concentrated sulphuric acid, a fragment of arseniate of potassium added, and well triturated. Upon heating the mixture, under gentle shaking, until vapors are evolved, a handsome blue-violet color is produced, which on continued heat becomes dark brown-red. Upon careful dilution with water a reddish color is produced, which changes to green on further dilution with water. If this solution be shaken in a test tube with chloroform, the latter assumes a splendid violet color, while ether, under the same conditions, becomes violet-red. A second reaction is the following: the morphine is triturated with concentrated sulphuric acid, as above, and a drop of a solution of 1 p. chlorate of potassium in 50 p. of sulphuric acid is added cold. A handsome grass-green color, which remains for a long time, is developed. It shows a faint rose-red color on the edges.—Arch. d. Phar., Aug. 1886, 717; from Jour. Prakt. Chem., 33, 563.

Morphine—Reaction with Phosphates.—Dr. G. Vulpius draws attention to the following reaction of morphine with phosphates and sulphuric acid: If a liquid containing at least ¼ milligram of a morphine salt, or this salt in substance, is mixed in a porcelain capsule with about 6 drops of concentrated sulphuric acid, a few centigrams of phosphate of sodium added, and the capsule heated carefully over a flame, the contents will assume, when white vapors begin to appear, a violet color, and if rapidly cooled a violet-like odor. By longer heating the color changes to brownish. If water is added drop by drop to the cooled mixture, the violet color is changed to bright red, and when 3–5 grams have thus been added, changes to dirty green. If it is now shaken with an equal weight of chloroform in a test tube, the latter liquid assumes a handsome blue color. —Arch. d. Pharm., March, 1887, 256–257.

Morphine—Behavior to Chromates of Potassium.—The observation that strychnine and brucine solutions afford very sparingly soluble precipitates with the chromate of potassium induced Mr. Franz Ditzler to experiment with morphine in the same direction, in the hope that a volumetric method for the rapid determination of morphine might be established. The results of the experiments proved the inapplicability of the chromates to this end, though, under certain conditions, a very sparingly and easily separable chromate is formed. The author finds that if a morphine solution is shaken with an excess of solution of neutral chromate of potassium, morphine is principally precipitated. If, on the other hand, very small quantities of the neutral chromate are gradually added to the morphine solution, chromate of morphine is mainly precipitated. The

Chromate of Morphine so produced adheres quite firmly to the side of the vessel in form of light-yellow needles, whilst the morphine is loose and may be readily washed away. Analysis of these crystals leads to the formula $(C_{17}H_{19}NO_3)_2H_2CrO_4$, proving the compound to be the neutral chromate of morphine. The compound becomes grayish-yellow when exposed to light, as well as when heated on the water-bath in the dark, showing at least superficial decomposition under these conditions.—Arch. de Phar., Aug. 1886, 701–705.

Morphine Hydrochloride—Solubility in Rectified Spirit.—Mr. D. B. Dott has determined the solubility of hydrochloride of morphine to be one part in forty parts of rectified spirit at 16° C.—Pharm. Jour. and Trans., May 21, 1887, 941.

Meconate of Morphine—Non-Existence of an Acid Salt.—Mr. D. B. Dott communicates some experiments made to determine the existence of an acid meconate of morphine. The results render it exceedingly doubtful whether an acid meconate really exists. There certainly is no evidence that it has ever been prepared, and all references, therefore, to "bi-meconate" of morphine must be taken as referring to a purely hypothetical compound.—Pharm. Jour. and Trans., Feb. 26, 1887, 690.

Dehydromorphine—Distinction from Morphine.—Mr. J. Donath gives the following method to distinguish dehydromorphine (oxydimorphine) from morphine. A little dehydromorphine is placed into a porcelain capsule, about 8 drops of pure sulphuric acid, containing 2 vol. of conc. sulphuric acid, and 1 vol. of water, are added, and the mixture carefully shaken over a small flame, until sulphuric acid vapors begin to appear. The liquid thus treated will assume a handsome blue-green color. When carefully diluted with water it rapidly turns to rose-red, and if now an oxidizing agent (1 to 2 drops of concentrated nitric acid and 1 drop of solution nitrite or hypochlorite of sodium) is added, the color is changed to splendid deep violet. The morphine, when heated with pure sulphuric acid, as above, forms a rose-red solution, changing to dirty brown; upon dilution with water it becomes reddish, and on addition of the oxidizing agent magnificently raspberry-red.—Arch. d. Pharm., Aug., 1886, 717; from Journ. Prakt. Chem., 33, 559.

Pseudomorphine—Distinction from Morphine.—Dr. O. Hesse corrects some errors concerning the history of pseudomorphine as published by Donath, and adds some reactions for distinguishing it from morphine. Morphine dissolves in pure sulphuric acid with a faint reddish color (not colorless), while the colorless solution of pseudomorphine becomes yellowish, then reddish. In the presence of a trace of ferric salt, the solution of morphine is reddish, that of pseudomorphine blue, turning deep violet and finally brown-green. Mixed with an equal weight of cane sugar, morphine yields with sulphuric acid, either pure or in the presence of iron, a violet-red solution. Under the same conditions pseudomorphine gives with pure sulphuric acid a deep green solution becoming brown-green; and in the presence of iron a beautiful blue solution, becoming dark-green. On substituting milk-sugar or glucose for the cane-sugar, pseudomorphine gives with pure sulphuric acid a colorless solution turning slowly to greenish and bright blue-green; presence of ferric salt causes the color reactions to be more rapid and intense. These color reactions are characteristic for pseudomorphine.—Liebig's Annalen, 235, 253.

Pseudomorphine—Identity with Oxydimorphine.—Dr. O. Hesse states that the oxydimorphine of Polstorff (Berichte D. Chem. Ges., 1880) is identical with pseudomorphine, and is formed in Keiffer's reaction (Annalen, 1859, vol. 103) by treating 1 molecule of morphine hydrochlorate in aqueous solution with 2 mol. potassium hydrate and adding 1 mol. potassium ferricyanide; pseudomorphine is at once precipitated, only a minute amount remaining dissolved in the mother-liquor. The total yield was 88.4 per cent.; theory requires 99.6 per cent. The oxidation takes place according to the equation:

$$\underset{\text{Morphine.}}{2C_{17}H_{19}NO_3} + O = \underset{\text{Pseudomorphine.}}{C_{17}H_{18}NO_3.C_{17}H_{18}NO_3} + H_2O$$

—Liebig's Annalen, 235, 229.

Papaverine—Composition.—Merck, who discovered papaverine, assigned to it the formula $C_{20}H_{21}NO_4$. This formula was found to be correct by Anderson, by Jörgensen, and by How; but Hesse contested the correctness of the formula, and gave to the alkaloid that of $C_{21}H_{21}NO_4$, which formula was subsequently accepted as correct by Becket and Wright, and is now so given in most text-books, some few, however, retaining the original formula with C_{20}. Prof. P. C. Plugge had hitherto also accepted the formula of Hesse as the correct one, until very recently his attention was drawn to the investigations of Goldschmidt (Monatshefte für Chemie, vi, 667), which very clearly show that Merck's original formula must be the correct one, viz., $C_{20}H_{21}NO_4$. Prof. Plugge has now made four determinations of the ultimate constituents of papaverine, and has in this and other directions obtained results which fully agree with those of Goldschmidt and Merck, and establish beyond a doubt the correctness of the formula $C_{20}H_{21}NO_4$.—Arch. d. Pharm., May, 1887, 421–425.

Papaverine—Decomposition Products.—Mr. Guido Goldschmidt, in continuation of his researches on papaverine, finds that when its solution in dilute hydrochloric acid is treated with metallic tin, it takes up 4 atoms of hydrogen and is converted into

Tetrahydropapaverine, $C_{20}H_{25}NO_4$, which is present in the solution as a double salt of tin. The tin is precipitated by means of H_2S, and the chlorhydrate of the new base is obtained from the filtrate by crystallization.

Chlorhydrate of Tetrahydropapaverine, $C_{20}H_{25}NO_4HCl + 3H_2O$, forms small colorless prisms, which effloresce rapidly in the air. Its taste is quite bitter. It melts at 290°, being at the same time violently decomposed.—Arch. de Phar., Nov. 1886, 981; from Monatsh. f. Chem., 7, 485.

Thebaïne—Chemical Relations.—Messrs. W. C. Howard and W. Roser have determined that by the action of concentrated hydrochloric or hydrobromic acid thebaïne is split into

Morphothebaïne ($C_{17}H_{17}NO_3$) and chloride of methyl (CH_3Cl), two molecules of the latter being formed. When the new base is heated for some time on a water-bath with methyliodide in methyl-alcoholic solution, crystals of

Morphothebainemethyl iodide, in form of quadrangular tables, separate out and are readily purified by recrystallization. The composition of this compound corresponds to the formula $C_{17}H_{17}NO_3,CH_3I$. Analogous compounds with ethyl iodide and with benzyl chloride were also obtained.—Arch. d. Pharm., Aug. 1886, 716; from Ber. d. D. Ch. Ges., xix, 1596.

Narceine—New and Characteristic Reaction.—Prof. P. C. Plugge states that when a trace of narceine is covered in a porcelain capsule with *dilute* sulphuric acid, no change is observable; but if the capsule is heated on the water bath, a magnificent blue color is developed as soon as the acid has become sufficiently concentrated, and by prolonged heating passes to cherry red. If to this red liquid, after cooling, a trace of nitric acid or of nitrite of potassium is added, blue-violet streaks are produced in it. The author has compared this test with other characteristic tests for narcotine, particularly with that of *concentrated* sulphuric acid, Arnold's reaction—heating narceine with concentrated sulphuric acid and adding a trace of phenol—and the iodine reaction. He finds:

(1) That concentrated sulphuric acid produces a green-yellow color with 0.000005 gram narceine.

(2) That Arnold's reaction produces a very handsome and characteristic red color provided the quantity of alkaloid is not too small.

(3) That iodine water gives a distinct blue color with 0.000015 narceine.

(4) That evaporation with dilute sulphuric acid also gives a faint red color with 0.000015 narceine.—Arch. d. Phar., May 1887, 425–427.

Narcotine Hydrochloride—Experiments Respecting the Alleged Gelantinous Character of its Solutions.—The statement of Mr. D. B. Dott that "strong solutions of hydrochloride of narcotine show a curious tendency to gelatinize, like the salts of cryptopia" (see Proceedings 1884, 304), has led Messrs. T. and H. Smith to make a number of experiments with a view to testing the correctness of the statement. Comparative experiments made with a 2 per cent. solution of gelatin and a 1½ per cent. solution of cryptopia in water containing 1½ per cent. of hydrochloric acid, showed the cryptopia jelly to possess greater firmness and consistency than the gelatin jelly. Solutions of hydrochloride of narcotine were then prepared of different strengths up to 50 per cent with and without excess of hydrochloric and sulphuric acids; but in no case was there the slightest indication of gelatinization. Respecting the 1½ per cent. solution of

Hydrochloride of Cryptopia, which had been acidulated with 1½ parts in 100 of a 40 per cent. sulphuric acid, the authors observe that it gave a jelly like the hydrochloride of cryptopia of the same strength without acid; but a very striking change takes place in a day or two, when a number of white spots are observed in the jelly, and these go on increasing in number and size, growing into beautiful radiated tufts of crystals, until they fill almost the entire space of the original jelly, forming to the eye a crystalline compact mass, with a thin liquid at the top.—Phar. Jour. and Trans., Jan. 8, 1887, 545.

Quinine Salts—Solubility, etc.—Messrs Regnauld and Villejean have made careful experiments to determine the solubility of different quinine salts, and have determined the following solubilities:

1	part	of	hydrobromate	at	13°	requires	50.36	parts	water.
1	"	"	hydrochlorate	"	12°	"	26.36	"	"
1	"	"	lactate	"	15°	"	9.56	"	"
1	"	"	salicylate	"	15°	"	880.00	"	"
1	"	"	sulphate	"	15°	"	680.00	"	"
1	"	"	valerianate	"	16°	"	38.70	"	"

These solubilities refer to the basic salts, and the quantities are calculated for the salts in their anhydrous state. Respecting

Lactate of Quinine the authors observe that a basic salt of normal composition can only be obtained when the lactic acid to be saturated with quinine hydrate is diluted with at least twice as much water as is necessary to dissolve the lactate formed. In more concentrated solutions an excess of quinine hydrate will be dissolved and contaminates the product obtained by evaporation. Respecting the solubility of

Mixture of Sulphate of Quinine and Sulphate of Cinchonidine, the authors have made the interesting observation that when the mixture is dissolved in hot water and allowed to cool, a larger proportion of sulphate of cinchonidine separates out with the quinine salt than is in conformity with its solubility in water, a correspondingly smaller amount of sulphate of cinchonidine being retained in the filtrate.—Arch. d. Pharm., April 1887, 359; from Journ. de Pharm. et de Chim., 1887, xv, 110 and 119.

Sulphate of Quinine—Amount of Cinchonidine present in the Commercial Salt.—In view of the circumstance that Dr. De Vrij continues to employ the optical method for the determination of cinchonidine in commercial sulphate of quinine, notwithstanding the unfavorable comments of Dr. O. Hesse (see Proceedings 1886, 605), and by reason of the concession by Dr. De Vrij not to examine Dr. Hesse's quinine by the optical method, but by the so-called bisulphate test, Dr. Hesse has now made some inquiries into the value of the latter test. Without going into the details of Dr. Hesse's experiments, which were evidently made with his usual care, it may be briefly stated here that the data obtained show conclusively that in the bisulphate test the amount of sulphate of cinchonidine calculated from the results is never too low, as De Vrij says it is, but that it is always too high, and exactly as much too high as the amount of De Vrij's simulated sulphate of cinchonidine exceeds the quantity that is really present, or on the average 61 per cent. In other words, the amount of cinchonidine indicated when the bisulphate test is carried out by Dr. De Vrij's method is increased by the presence of quinine, for the larger part in combination with the cinchonidine and partly carried with it, to the extent named. Dr. Hesse shows, however, that the bisulphate test, when carefully carried out, will furnish very satisfactory results in regard to the amount of cinchonidine, and that it excludes every kind of fallacy such as may result with the hazardous optical method. It is desirable to operate with 5 grams of the sulphate under examination. This quantity is dissolved with 12 cc. of normal sulphuric acid in a small porcelain basin with the aid of heat, then to pour the solution into a funnel closed at the bottom, rinsing the basin out with a few drops of water. The crystallization of the bisulphate soon commences, and is complete after two hours. By then removing the stopper of the funnel the mother liquor may be drained away, and any residue of the same removed by the suction pump. The upper portion of the crystals should then be pressed down with a glass rod and washed with 3 cc. of cold water added drop by drop while the suction is being kept up. The whole solution is then to be mixed with 16 cc. of ether of sp. gr. .721 to .728 and shaken up, then 3 cc. of ammonia solution of sp. gr. .960 added, and the whole well shaken again. After standing one day the ether is removed with a pipette, the crystals that have separated are collected upon a filter and washed with water saturated with ether. After this the filter should be placed upon an absorbent surface and the crystals again washed with some ether before being dried at 100° C. These crystals, representing the whole of the cinchonidine present in the sample, are a compound of 1 mol. of quinine with 2 mol. of cinchonidine ($C_{20}H_{24}N_2O_2, 2C_{19}H_{22}N_2O$), but almost always contain some adhering quinine. Hence, instead of multiplying their weight by 0.645 to ascertain the proportion of cinchonidine, in accordance with the formula of the compound, the author gives the number 0.62 as the mean result of all determinations he has made in reference to this mode of testing. He finds that tested by this method commercial sulphate of quinine is frequently shown to contain less than 5 per cent., and very often only from 2 to 3 per cent., of sulphate of cinchonidine; quantities which, in view of the increased expense attending the preparation of absolutely pure sulphate of quinine, should be admitted for medicinal purposes.—Pharm. Journ. and Trans., Dec. 18, 1886, 485–487.

Sulphate of Quinine—Sources of Error in the Pharmacopœial Tests.—Dr. Louis Schäfer draws attention to several possible sources of error in carrying out the tests of the different Pharmacopœias for the presence of sulphate of cinchonidine in commercial sulphate of quinine. He observes that in its well crystallized condition sulphate of cinchonidine dissolves very slowly in water at the ordinary temperature, notwithstanding the fact that it must be considered a readily soluble salt. It may therefore occur that an article of sulphate of quinine contains a considerable percentage of sulphate of cinchonidine, and yet an insufficient quantity be dissolved to reveal the presence of an undue quantity in the filtrate. On the other hand, when the salt has effloresced, and consequently contains a large percentage of absolute alkaloidal salt, the test as generally carried out may indicate an undue quantity of the cinchonidine salt, when in reality it contains not more than the admissible quantity. Both the sulphate of quinine and cinchonidine are readily attacked by water at the ordinary temperature when in the effloresced condition, whilst in their perfect crystalline condition they resist the attack very persistently. The author, therefore, suggests several modifications of Kerner's and Hesse's tests. In the one modification he directs treatment of the suspected sulphate with water at 100° C. for a certain time, then allowing the mixture to cool, and immersing it in a cold water-bath at 180° C. for half an hour, with occasional stirring. The filtrate is then tested in the usual manner. The second modification of Kerner's test consists in drying a weighed quantity of the sulphate completely at 100° C., and then treating the effloresced salt with water at 18° C. in the usual manner. The author also finds DeVrij's method of estimating the sulphate of quinine as *bisulphate* to yield good results under certain modifications, as follows: 5 grams of sulphate are dissolved by the aid of heat in 12 cc. of normal sulphuric acid (49 gram H_2SO_4 to the liter); the solution is allowed to crystallize, with frequent stirring, at first at the temperature of the air, and finally on a cold-water-bath. After one hour the crystals are collected in a small filter provided with a very small filter, drained, and washed with cold water in small portions, until 12 cc. of filtrate have passed. The filtrate is mixed with 20 cc. of ether, sp. gr.

0.728, and 3 cc. aqua ammonia, sp. gr. 0.960, the mixture is well shaken, allowed to separate, and the ether solution decanted with a pipette, observing that none of the ammoniacal liquor shall contaminate the ether solution. The residual ammoniacal liquor is treated once more with 20 cc. of ether in the same way, the united ethereal liquids are evaporated to 8 or 10 cc., allowed to cool, and set aside in a carefully corked flask for twenty-four hours. In the absence of cinchonidine, none of the characteristic, glossy-glistening, prismatic crystals, adhering on the sides of the vessel, will be observed.—Arch. d. Pharm., Oct. 1886, 844–848.

Quinine Sulphate—Kerner's Test Critically Examined.—Mr. E. A. Ruddiman has contributed a first installment of a paper detailing his experiments on the estimation of quinine by Kerner's method, his studies embracing the following points:

1. As to the effect of an initial digestion of the medicinal sulphate of quinine in water at 100° C., followed by the digestion at 15° C., in comparison with results obtained by digesting at once at 15° C.

2. As to the effect of variations in the temperature of the liquid during titration or the amount of ammonia necessary to redissolve the precipitate —filtration being always done at 15° C.

3. As to the accuracy of Kerner's figures for the amount of ammonia water, s. g. 0.920, required to dissolve 1 milligram of cinchonidine sulphate.

4. A proposed modification of the method for the quantitative estimation of cinchonidine sulphate in quinine sulphate.

5. On the amount of water which should be taken in applying Kerner's test to salts of quinine other than the sulphate.

For the details of these investigations reference must be had to the author's paper in Pharm. Era, June 1887 (199–200 et seq).

Quinine—Kerner's Test as Modified in the French Pharmacopœia.—Mr. E. Jungfleisch communicates a lengthy and highly interesting criticism of Kerner's test as applied by the Codex. He admits that the test as it now stands in the Codex of 1884 leaves much to be desired, but it does not merit all the censure that has been bestowed upon it. Though a delicate test, and in some respects even too delicate, it is nevertheless susceptible of being made use of by every pharmacist. It has, moreover, a characteristic which he would like to believe is ephemeral, but which may for the time be allowed to cover all its defects: among the tests which admit of the detection of the alkaloids most usually mixed with quinine sulphate it is still the least imperfect, the most simple, and the most expeditious. The author's paper, in translation, may be consulted in Amer. Journ. Pharm., March 1887, 136–146.

Sulphate of Quinine—Chromate Test.—Dr. De Vrij has devised a new method for determining the purity of sulphate of quinine, which may be designated as the "chromate test," and which is found by Dr. G. Vulpius not alone to give very accurate results, but also admits of the weighing of the cinchonidine that may be present. The method is carried out as follows: 5 grams of the sulphate of quinine are dissolved in 500 grams of water at the boiling temperature, and 1.20 grams of chromate of potassium dissolved in a little hot water is added. The precipitate at first produced is rapidly redissolved, and in 5 to 10 seconds crystallization begins, splendid star-shaped groups of sulphur yellow needles of anhydrous chromate of quinine—$2(C_{20}H_{24}N_2O_2)H_2CrO_4$—being formed. The separation of these crystals is practically complete when the liquid has cooled, but it is advisable not to collect the crystals before the day following their formation. They are washed with a small quantity of water, dried and weighed; 766.5 of chromate of quinine are equal to 648 of quinine or 890 of sulphate of quinine. The mother liquors contain the cinchonidine together with a small quantity of chromate of quinine amounting to 0.05 gram in 100 grams, and to this extent the yield of chromate of quinine, by weighing, must be corrected. To ascertain the amount of cinchonidine present the total filtrate and washings are rendered alkaline by soda solution and evaporated to 300 grams. The cinchonidine separates during the heating, and, after cooling, is collected on a filter, dried at 100° C. and weighed.—Arch. d. Pharm., Dec. 1886, 1022–1023; from Pharm. Centralh., 1886, 27, 559.

Dr. Vulpius in a subsequent paper (Phar. Centralh., 1886, 27, 583) records some experiments made to determine to what extent the mother-liquors resulting from the crystallization of the chromate of quinine retain quinine and represent the other cinchona alkaloids that may be present. Operating with 2 grams of chemically pure sulphate of quinine by itself, and with the same quantity with additions of 0.1 gram of the sulphate of quinidine, cinchonine and cinchonidine, he obtained the following quantities of precipitate on treatment of the mother-liquor with soda solution and evaporation to $\frac{3}{5}$ of the original volume:

	Expected.	Obtained.
In case of pure sulphate of quinine	0.	0.008
With addition quinidine	0.083	0.075
" cinchonine	0.081	0.076
" cinchonidine	0.074	0.070

These results must be regarded as satisfactory. Another series of experiments determined that no chromate of quinine, cinchonine or cinchonidine is precipitated under the above conditions.

Sulphate of Quinine—Chromate Test.—Mr. O. Schicking has subjected Dr. DeVrij's chromate method for the examination of sulphate of quinine to experimental examination. He finds that chromate of cinchonine is equally insoluble with chromate of quinine—requiring 2000 parts of water for solution—and therefore crystallizes out with this if present in appreciable quantities. The chromates of quinidine and cinchonidine, on the other hand, are comparatively soluble salts. The authors make some interesting suggestions, for which see Arch. d. Phar., Feb. 1887, 128–129; and Phar. *Z*tg., 1887, 32, 23.

Quinine Chromate—Composition.—Dr. O. Hesse draws attention to the formula for neutral chromate of quinine as given by Dr. De Vrij, under the assumption that the anhydrous salt is obtained by simple drying in the air, is incorrect, since the compound contains 2 mol. H_2O. These it will lose and become anhydrous, though with liability to incipient decomposition, when heated to constant weight at 80° or 90° C. The molecular weight of the compound must therefore be taken at 802.5 instead of 766.5. These strictures of Dr. Hesse are called forth by the newly-proposed method of Dr. De Vrij, for which he claims great accuracy, not alone for determining the

Cinchonidine in Quinine, but also for the determination of *quinine* itself. For the latter purpose it is said to be merely necessary to dissolve 5 grams of quinine sulphate in 500 cc. of hot water, adding then a solution of 1.2 grams of neutral chromate of potassium in a little warm water, and after leaving the whole to cool for twelve hours, collecting the crystals of neutral chromate of quinine on a filter, washing them with a little distilled water, and drying in the air. Their weight is then corrected by the further quantity of 0.05 gram for every 100 cc. of mother liquor and wash water, the quinine salt being soluble in water to that extent.—Pharm. Journ. and Trans., Jan. 22, 1887, 585.

In a second paper (Ibid., February 19, 1887), Dr. Hesse questions the reliability of the chromate test for the detection of cinchona alkaloids other than quinine, the chromates of all of them being precipitated with the quinine.

Chromate of Quinine—Earlier Description, etc.—Referring to the interesting investigations of DeVrij respecting the determination of the purity of sulphate of quinine by means of chromate of potassium, Mr. Gallois draws attention to the fact that André had already in 1862 (in "Jour. de Pharm.") communicated the results of experiments respecting the action of chromic acid upon alkaloids, and had not alone described the chromates of all the cinchona alkaloids, with the exception of that of cinchonidine, but had pointed out some of the difficulties attending the determination of pure quinine as chromate.—Arch. d. Phar., April 1887, 359; from Jour. de Phar. et de Chim., 1887, xv, 76.

Sulphate of Quinine—Oxalate Test.—Mr. Z. Schäfer records experiments made to test the reliability of the different tests for the purity of sulphate of quinine. He finds the various modifications of Kerner's test, as well as all other tests in which the sulphate of quinine is not completely dissolved, to be unreliable. Hesse's test, modified (1 gram sulphate boiled with 20 parts of water, allowed to cool, filtered, 5 cc. of the filtrate rendered alkaline and shaken with 1 cc. of ether), gives also unreliable results. The two methods of DeVrij—the bisulphate and the chromate methods, which see above—are far more reliable, since in these all of the sulphate of quinine enters into solution, and of these two the "chromate method" gives without doubt the most accurate results of any of the methods that have hitherto been published. The author, however, is in possession of a method which with the greatest certainty is capable of determining small quantities of cinchonidine, and which is both simple and expeditious. The method may be designated as the

Oxalate Method, and is based on the extremely sparing solubility of oxalate of quinine in water containing a faint excess of oxalate of potassium, and the comparatively ready solubility of oxalate of cinchonidine in such a solution. Two grams of sulphate of quinine are dissolved at the boiling temperature in a small tared flask containing 55 cc. of distilled water, 0.5 gram of neutral oxalate of potassium dissolved in 5 cc. of water is added, the contents are shaken, and the weight of the liquid is brought to 62.5 grams by the addition of water. The flask is then placed in water at 20° for half an hour, and now and then shaken. In the presence of less than 1 per cent. of sulphate of cinchonidine, a drop of solution of soda added to the filtrate will not affect its brightness, but if 1 per cent. or more is present the liquid becomes turbid or a precipitate of cinchonidine is formed. To determine the quantity of sulphate of cinchonidine that may be present it is advisable to take 5 grams of the sample, but to operate otherwise in the same manner and in the same proportions. The filtrate is treated with solution of soda in excess, and the precipitated cinchonidine collected, dried and weighed in the usual way. It is necessary to compensate for the small quantity of cinchonidine held in solution by the filtrate. The correction necessary in the author's experience is 0.04 gram for each 100 cc. of the solution from which the cinchonidine has been precipitated. The oxalates of quinidine and cinchonine being even more soluble than oxalate of cinchonidine, their presence can be determined with equal facility.—Arch. d. Pharm., Jan. 1887, 64-72.

Sulphate of Quinine—Optical Method of Examination.—Mr. David Hooper contributes his experience with the method of estimating quinine by means of the polariscope. His results show that while there are numerous processes that are often more applicable to a single object, such as the estimation of quinine, in places where some of these processes are not practicable the optical method may be used with advantage by those who are in the habit of using it. The author finds that the mixed alkaloids, or suspected sulphates, are preferably converted into the tartrates, which are more constant in the proportion of combined water than the sulphates. The author's paper may be consulted in Phar. Jour. and Trans., July 24, 1886, 61.

Sulphate of Quinine—Optical Method of Examination.—Messrs. G. Kerner and A. Weller communicate a lengthy criticism of the optical method for the determination of cinchonidine in sulphate of quinine, as well as a series of experiments to determine its value. They conclude that the method is liable to give perfectly illusory results, since sulphate of quinine always contains other cinchona alkaloids, besides cinchonidine. They admit, however, that in case of pure mixtures of the sulphates of two cinchona alkaloids only, which are known, the optical method is not alone a good one, but the most accurate of all.—Arch. d. Phar., Feb. 1887, 112–127.

Sulphate of Quinine—Incompatibility with Bichloride of Mercury.—Mr. T. H. Powell had occasion to dispense the following prescription: Tinct. ferri perchlor., ʒvj; quin. disulph., gr. xlviii; acid. hydrochlor. dil., q. s.; liq. hydrarg. perchlor., ℥iv; aq. dest. ad ℥xij. The mixture, at first perfectly clear straw-colored, after a few minutes standing deposited a heavy white granular precipitate, which on examination proved to be the double chloride of mercury and quinine.—Pharm. Jour. and Trans., June 11, 1887, 1010–1011.

Hydrochlorate of Quinine—Advantages Over the Sulphate.—Mr. Henry W. Fuller advocates its use for medicinal purposes by preference over the sulphate on the following grounds:

(1) Hydrochlorate of quinine is combined with a smaller quantity of acid (hydrochloric acid is better for the system than sulphuric).

(2) Hydrochlorate of quinine is more soluble in water than the sulphate, and consequently more effective.

(3) Hydrochlorate of quinine contains a larger proportion of alkaloid (quinine), which is the real febrifuge.

To the foregoing he adds that it is comparatively easy to produce the hydrochlorate in a high degree of purity.—West. Drugg., July 1886, 256; from Proc. Ills. Pharm. Assoc., 1886.

Quinine—Use of Saccharin to Disguise the Taste.—Fahlberg's saccharin-chinin is a mixture of 36 parts saccharin and 64 parts of quinine. Pallatschek recommends the following mixture: Saccharin 1.07, sodium bicarb. 1.2, distilled water 100.0, sulphate of quinine 1.0. Saccharin is almost insoluble in water; its solubility is considerably increased by the addition of bicarbonate of sodium. A small quantity of this saccharin mixture suffices to agreeably sweeten the food and beverages of diabetic patients.—Pharm. Centralh., xxviii. 253.

Conquinine—Formation of Alcoholate.—Dr. O. Hesse has stated that conquinine (quinidine) crystallizes from its alcoholic solution with 2½ mol. of water. This, according to the experiments of Mr. E. Mylius, is not the case, the crystals containing 1 mol. alcohol, and corresponding to the formula $C_{20}H_{24}N_2O_2 + C_2H_6O$. The alcoholate loses the alcohol when heated to 120° or when in contact with water.—Arch. d. Phar., Sept. 1886, 806; from Ber. d. D. Ch. Ges., xix, 1773.

Cinchonidine Sulphate—Commercial Quality.—Seven samples of this salt were examined by Mr. Thos. J. Backes, and found to be pure, except one, which left 6.6 per cent. of ash, consisting of magnesium compound. The loss of water by exsiccation at 100° C., varied between 8.2 and 11 per cent.—Amer. Jour. Phar., Nov. 1886, 539.

Cinchol—Characters, etc.—Accompanying kinovin Dr. Giesel observed a crystallizing compound which Liebermann named oxychinoterpene. Dr. O. Hesse regarded this compound to be identical with his cinchol; but Liebermann, while admitting close agreement of the two compounds, preferred to name it *cholestrol*, because of its resemblance, in distinction from Hesse's cinchol, to cholesterin. Dr. Hesse has now reëxamined the substance, and has shown that the needle-shaped scales of cinchol prepared from cinchocerotin, after fusion, will crystallize in broad laminæ, and that the compound from both sources may, therefore, be obtained in crystals resembling prisms or scales. The acetyl-cinchol prepared from the two bodies, crystallizes in prisms, or after previous fusion, in scales; the melting point is 124° C.—Liebig's Annal., 234, 375.

Strychnine and Brucine—Separation as Ferrocyanides.—Messrs. Holst and Beckurts have worked out a volumetric method for the quantitative determination of strychnine and brucine, which is based upon the observation of Messrs. Dunstan and Short that sulphate of strychnine is completely precipitated from its aqueous solution by ferrocyanide of potassium, while sulphate of brucine is not. If to a strongly hydrochloric acid solution of the two alkaloids (containing from at least 0.5 to 1 per cent. of the bases), solution of ferrocyanide of potassium is added until a filtered drop of the liquid produces a blue color on paper saturated with ferric chloride, the strychnine is completely separated in form of acid ferrocyanide ($C_{21}H_{22}N_2O_2.H_4Fe(CN)_6$), and the whole of the brucine remains in solution. The method becomes volumetric by employing measured quantities of solution of ferrocyanide of known strength: 224 parts of the latter being required to precipitate 334 parts of strychnine as acid ferrocyanide. The authors have also prepared and studied the character of the neutral and acid ferrocyanides of brucine and strychnine, and of the neutral ferrocyanides, acid ferrocyanides not being formed.

Neutral Ferrocyanide of Strychnine, $(C_{21}H_{22}N_2O_2)^4.H_4Fe(CN)_6+4H_2O$. This is obtained by precipitating solutions of neutral strychnine salts with ferrocyanide of potassium. It is a white crystalline powder, having a faint yellowish tinge, sparingly soluble in cold water, more readily in hot water, and crystallizing from the latter in well-formed prismatic crystals.

Acid Ferrocyanide of Strychnine, $(C_{21}H_{22}N_2O_2)H_4Fe(CN)_6$, is precipitated by ferrocyanide of potassium from strongly acid (hydrochloric) solutions of a strychnine salt. It constitutes a white powder, having a bluish tinge, is insoluble in cold water and in alcohol, and dissolves in hot water, with decomposition, ferrocyanhydric acid being separated and split up with formation of a blue color into hydrocyanic acid. Under the microscope the acid salt shows indistinct crystals. It has a strong acid reaction, decomposes carbonates, and is decomposed with separation of alkaloid by ammonia and the alkalies.

Neutral Ferrocyanide of Brucine, $(C_{23}H_{26}N_2O_4)_4H_4Fe(CN)_6+4H_2O$, is obtained by treating a neutral concentrated solution of hydrochlorate of brucine with ferrocyanide of potassium. It forms yellow prismatic crystals, arranged in tassel-shaped bundles, which form yellow solutions with water and with alcohol. Exposed to air it is gradually decomposed, splitting up into brucine and green-yellow ferricyanide of brucine.

Acid Ferrocyanide of Brucine, $(C_{23}H_{26}N_2O_4)H_4Fe(CN)_6$, is obtained from very concentrated and strongly acid hydrochloric solutions of brucine. It constitutes a white powder, becoming blue on exposure to air, and showing well-formed prismatic crystals under the microscope. From weaker solutions the salt begins to separate after 12 to 24 hours in form of large handsome white prisms. Like the corresponding strychnine salt it is decomposed by hot water with liberation of ferrocyanhydric acid and further decomposition of this latter under formation of a blue color.

Neutral Ferricyanide of Strychnine, $(C_{21}H_{22}N_2O_2)_6H_6Fe_2(CN)_{12}+12H_2O$, is formed by precipitation either from acid or neutral solutions of strychnine salts with solution of ferricyanide of potassium. It forms golden yellow flat prisms, which are soluble in water with tolerable difficulty, but more readily than the corresponding ferrocyanide, forming yellow solutions.

Neutral Ferricyanide of Brucine, $(C_{23}H_{26}N_2O_4)_6H_6Fe_2(CN)_{12}+12H_2O$, is formed under the same conditions from either neutral or acid brucine solutions. It forms greenish-yellow, shining leaflets, which dissolve in water with some difficulty, forming yellow solutions.

The authors have applied their above method for the separation of strychnine from brucine to the examination of the total alkaloid obtained in the examination of pharmaceutical preparations of nux vomica, such as the tincture, extract, etc.—Arch. d. Phar., April 1887, 313–315; from Pharm. Centralh., 1887, 107 and 119.

Strychnol—Preparation and Characters.—Messrs. W. F. Loebisch and P. Schoop describe strychnol or

Strychnine Hydrate ($C_{21}H_{22}N_2O_2+2H_2O$). It is prepared by boiling strychnine with a mixture of sodium ethoxide and absolute alcohol. The strychnine dissolves with a yellow coloration, and on evaporating the mixture to expel the alcohol a brown oil remains, which in time becomes solid. On dissolving this in water and passing a current of carbonic acid through the liquid, strychnol separates as a slight yellow precipitate, which is further purified by solution in ammonia and reprecipitation. It then forms a white crystalline mass, consisting of microscopic wedge-shaped needles; it does not give the strychnine reaction with bichromate of potassium and sulphuric acid, but is colored an intense carmine-red with sulphuric and nitric acids. At 150° the greater part of the water is lost, but decomposition takes place, and strychnine cannot be obtained from the residue. When the strychnol is boiled with dilute acids, or allowed to remain in contact for some time with strong acids, it is dehydrated and strychnine is formed. It is sparingly soluble in cold water, easily in hot, and is precipitated from its acetic solution by the usual alkaloid reagents. The authors point out the close relation between the color reactions of strychnol and brucine, and also the identity of their respective actions with bromine.—Monatshefte f. Chem.; Pharm. Jour. and Trans., Oct. 30, 1886, 352.

Strychnine—Antagonism to Alcohol, etc.—The results of Dr. Jarochewsky's recent experiments on dogs, are summed up as follows: Strychnine prevents alcoholic inebriation; at the same time it enables the organism to support large doses of alcohol for a very long time; it preserves the organs (liver and vessels) from the characteristic alterations produced by alcoholism. The action of strychnine is, up to a certain limit, paralyzed by alcohol; beyond this limit, strychnine becomes poisonous to the inebriated animal. Strychnine is an excellent medicament in all forms of alcoholism. It is also a powerful prophylactic.—Bull. Gén. de Thérap., May 30, 1887.

Strychnine—Specific Gravity.—Mr. Thos. P. Blunt has determined the density of strychnine crystals by preparing a solution of subacetate of lead of such density that a crystal of the alkaloid was suspended indifferently in any part of the fluid; the specific gravity of the liquid was found to be 1.13, which was therefore that of the crystal.—Pharm. Jour. and Trans., July 24, 1886, 62.

Strychnine Citrate—Composition and Solubility.—Mr. Frank H. Fischedick, in view of the absence of any information on the subject in works of authority, has determined the composition and solubility of citrate of strychnine. He finds that the salt crystallizes in two distinct forms: No. 1 in form of small, thin, micaceous plates, placed one above the other, transparent, and having a pearly lustre; No. 2 in form of small, needle-shaped crystals, radiating from one point to form silvery-white cones, which appear fan-shaped when seen from the sides. Both are acid salts; but they differ in the amount of their water of crystallization, No. 1 containing 4 mol., whilst No. 2 contains only 2 mol. The solubility of the salt, as determined by the salt designated as No. 1, is found to be 1 part in 45.5 parts of water or 114.83 parts of alcohol, the temperature of the solvents being at 15° C. The author examined the commercial citrate and found it to be an amorphous compound containing a percentage of strychnine that indicates its preparation by uniting molecular quantities of strychnine and citric acid so as to form a neutral salt, and then evaporating to dryness.—Phar. Jour. and Trans., Aug. 28, 1886, 170–171.

Arsenite of Strychnine—Medicinal Value.—Dr. Roussel recommends arsenite of strychnine as a substitute for arsenical preparations, especially Fowler's solution. Fowler's solution has its disadvantages, inasmuch as patients readily become accustomed to it, and when given in large doses it is apt to produce intoxication. When injected subcutaneously it does not possess the above mentioned disadvantages, but has little effect. Arsenite of strychnine injected hypodermically produces excellent results and is not painful. The dose to begin with should be small (0.001 gm). Arsenite of strychnine is a powerful antiseptic. In abdominal typhus it produces excellent results. Combined with salicylate of iron it is given in chronic anæmia, dyspepsia, etc.—Rundschau, Prag, xii, page 855.

Strychnine-sulphonic Acids—Formation.—Mr. Guareschi has obtained mono- and di-sulpho acids of strychnine by acting upon the alkaloid by ordinary concentrated and by fuming sulphuric acids respectively. The resultant more or less brown-colored fluids, when diluted with water, are not precipitable by alkalies; but, when saturated with bicarbonate of sodium, they are precipitable by acids. The sulpho-acids so separated will readily form barium salts.—Arch. d. Pharm., July 1886, 600; from Ann. Chim. Pharm., 1886, 65.

Dichlor-Brucine—Formation, etc.—Mr. Beckurts finds that the cherry-red color, produced when brucine is treated with chlorine water, is due to the formation of dichlor-brucine, which is obtained in the form of a red-brown, very hygroscopic powder, by evaporating the aqueous solution and finally drying over sulphuric acid. The red color at first produced by chlorine water disappears by excess of the latter, but is again developed during evaporation.—Arch. d. Pharm., Nov. 1886, 934.

A New Tetanus-Producing Alkaloid contained in *Gelsemium elegans*, Benth., which see under "Materia Medica."

Calabarine.—Doubt as to its existence in *Physostigma*, which see under "Materia Medica."

Crystallized Aconitine—Preparation, etc.—Mr. John Williams has communicated a paper on aconitine, in which he draws particular attention to the necessity of its preparation from tubers of *Aconitum Napellus* only, carefully excluding tubers from all other species, such as *A. ferox*, or of the Indian or Japanese plants, since these species do not yield identical alkaloids. Respecting the preparation, the author observes that the root should not be dried at a high temperature, so as to enable it to be finely powdered, but should be coarsely powdered only, the very fine powder being difficult to work. The powder is exhausted best by a combined process of maceration and percolation, maintaining the first about four days, returning the percolate to the powder, and macerating a second time; and even a third time, though wasteful, is regarded as an advantage. The amount of tartaric sufficient for all practical purposes is 4 ounces for each 1 cwt. of root, and the alcohol should be of a strength of 62° to 64° over proof, the acid being dissolved in this. The distillation of the spirit from the percolate, which must be at the lowest possible temperature, should be stopped before the whole of it has passed over; a little hot water is then added, and the last trace of spirit evaporated by gently heating on the water-bath. The thin aqueous extract is filtered through coarse dampened filter paper, the clear *acid* filtrate is shaken with an equal bulk of ether to remove remaining resin and oily matter, and, after separation of the ether, is gently warmed to drive off the last traces of the latter. From the aqueous liquor so obtained the crude alkaloid is precipitated by adding concentrated solution of carbonate of sodium (not bicarbonate) in slight excess, and the liquid gently warmed, whereby the alkaloid agglomerates and becomes a resinous looking mass. This is removed by the aid of a rod, washed in a small basin with moderately hot water until the wash water passes away quite colorless, and may then be readily dried and powdered. The dried brown crude alkaloid is now to be macerated in repeated portions of cold pure ether—i. e. ether well washed to remove alcohol and dried by means of anhydrous carbonate of potassium—in the cold, as long as any substance continues to be dissolved. The united ethereal solutions, after filtration, are then allowed to evaporate spontaneously in a light covered shallow capsule, though, if desirable, a portion of the ether may be evaporated by the aid of a water bath. The first crop of crystalline aconitine, when drained from the mother liquor, is pure; the mother liquor will yield additional crops of crystals which are, however, associated with gummy, extractive, and non-crystalline matter, to remove which washing with a little cold ether is necessary, the gummy matter being very much more readily soluble than the crystals. The crystals are finally dried on bibulous paper. Respecting the recommendation of different authors to secure the purity of aconitine by converting it into nitrate, the author observes that it has long been his opinion that aconitine is an alkaloid of a very delicate nature, and that it is very undesirable to bring it into contact with reagents of a powerful character, more particularly nitric acid. Indeed, his direct experiments seem to point out that the pure alkaloid obtained by his above method, which may be termed "normal" aconitine, differs in some respects from that obtained pure by the intervention of nitric acid. —Yearbook of Pharm., 1886, 428–433.

Atropine—Toxic Dose.—One-twentieth of a grain of atropine taken in a few divided doses during a day is regarded as a perfectly safe dose. Dr. C. Baum reports in Phila. Med. Times the case of a lady, who for acute coryza had been ordered two granules of atropine sulphate $\frac{1}{100}$ grain each, which were taken in two hours. Toxic symptoms appeared after the first dose, which were greatly aggravated after the second dose, but yielded to appropriate treatment.

Hydrobromate of Hyoscine—Hypnotic Value.—Dr. S. G. Webber finds this compound to have the advantage of being almost tasteless, while the dose is small. He has administered it to patients in the Adams Nervine Hospital, and his experience with the drug on the whole is that it will act favorably with a large number of patients, that it is acceptable on account of its lack of taste and odor, and because of its small dose; the sleep obtained is very refreshing and natural; it is, however, rather more likely to leave unpleasant effects, and seems to lose its power by repetition sooner than either urethane or paraldehyde (which see). He began with a dose of $\frac{1}{120}$ grain, but soon increased it to $\frac{1}{80}$, using the following formula, and giving twenty minims and, in a few instances, twenty-five minims of this mixture:

℞.	Hydrobromate of hyoscine	gr. j.	
	Alcohol	ʒ iss.	
	Water sufficient for	ʒ xx.	M.

—Boston Med. and Surg. Journ., Oct. 14, 1886.

Solanine—Formation in Potatoes.—Dr. Geo. Kasser has proved the presence and isolated weighable quantities of solanine—hitherto obtained only from potatoes while unripe or during the time of sprouting—from potatoes which had been injured, and had afterwards been kept for some time in a cellar. In such cases the wound becomes covered with a kind of scurf, beneath which dark-colored spots and stripes are usually observed in the white tissue, and the potato has generally a disagreeable taste. It has not been ascertained whether under this circumstance the presence of solanine is due to the vital functions of the tuber, as is the case while sprouting, or whether it must be referred to the action of the fungoid mycelium appearing upon the wound, and regarded as a decomposition product of the nitrogenated constituents of the potato.—Zeitschr. f. Nahrungs Unt. u. Hygiene, 1887, 22.

Amorphous Cocaine—The Presence of Hygrine Responsible for its Non-Crystallinity.—Mr. Ralph Stockman has studied the cause of the non-crystallinity of cocaine and its salts. He classifies the cocaine salts now sent out by good makers roughly into two varieties. The first of these is crystalline, colorless, and odorless, but contains varying amounts of non-crystalline salts, generally in granular masses, mixed with imperfect crystals. The second is also colorless and odorless, but is in the form of granules, made by evaporating the solution of the salt with constant stirring. This latter variety is known to contain a considerable quantity of amorphous hydrochlorate. The author traces this condition to the presence of hygrine, the liquid alkaloid accompanying cocaine in coca leaves, which exercises a powerful solvent action on the cocaine and prevents the crystallization of its salts. It is exceedingly difficult to remove this liquid alkaloid from cocaine, the most generally successful method consisting in dissolving a tolerably pure specimen of the amorphous hydrochlorate in chloroform, and then precipitating with ether. The hygrine subsides to the bottom of the test tube much more quickly than a part of the cocaine salt does. On passing off the supernatant fluid before the cocaine has all settled, and allowing it to evaporate, a gummy mass remains, in which after some days crystals of hydrochlorate of cocaine form, if there be not too much hygrine present. The presence of hygrine has for its effect on the solubility of cocaine salts in different solvents, hence the different statements respecting their solubility. The author found the solubility of a very pure specimen of well crystallized hydrochlorate of cocaine in chloroform, absolute alcohol, and amylic alcohol, to be respectively 1 in 48, 1 in 34, and 1 in 70; while a specimen of non-crystalline hydrochlorate dissolved in the same liquids in the proportion of about 1 in 5, 1 in 3, and 1 in 8 respectively.

Pure Hydrochlorate of Cocaine should be entirely crystalline, colorless, odorless, and very slightly soluble in chloroform or absolute alcohol. To free it from amorphous salt, advantage may be taken of the great solubility of the latter in menstrua in which the crystalline hydrochlorate is very slightly soluble.—Phar. Jour. and Trans., April 23, 1887, 861–863.

Hydrochlorate of Cocaine—Improved Methods of Manufacture, of Assay and Tests.—In continuation of his former papers (see Proceedings 1885, 323–326) on the preparation, assay and tests for hydrochlorate of cocaine, Dr. E. R. Squibb has published a very lengthy communication in his "Ephemeris" (vol. iii, No. 1, Jan. 1887, pp. 906 to 931), in which the following subjects are fully considered and discussed: New process of manufacture; statistics of manufacture; process of assay; manufactures of cocaine; examination of market brands, by the chloroform test, by the sulphuric acid test, by the permanganate test, and by physiological tests; test for fluid extract of coca; summary of examinations; review and interpretation of tests; details of chloroform solubility test. Leaving the bulk of this interesting paper to be consulted in the original, the following may be briefly noted here:

Improved Process of Manufacture.—The leaves are coarsely ground, moistened well with water, containing 5 per cent. of its weight of sulphuric acid, and packed in large stone-ware percolators. They are then subjected to the process of repercolation until the extract is very dense and very concentrated. This solution is well agitated with kerosene oil and an excess of carbonate of sodium. The liberated alkaloid is dissolved and held by the kerosene comparatively free from coloring matter and all other substances. It is then washed out of the kerosene by means of acidulated water, and again precipitated by carbonate of sodium in presence of ether by agitation, when the alkaloid is practically colorless. From the ether it is washed out in fractions—the first of which contains most of the remaining coloring matter—by dilute hydrochloric acid. The nearly colorless fractions are evaporated at a very low temperature in very shallow pans with constant stirring, the product being a granular, coarse powder of broken crystals, which, when the larger lumps are crushed so as to pass through a No. 40 sieve, makes the nearly white and very nearly pure anhydrous salt supplied by the author.

Improved Process of Assay.—This is based upon the above improved method of manufacture, the author operating upon 100 grams of the leaves in No. 20 or No. 30 powder. For the details of the method reference may be had to the original. Results obtained with different lots aggregating 14000 lbs. of the leaves gave .594, .612, .626 and .793 per cent. of alkaloid.

Chloroform-Solubility Test.—The author recommends the following test, which is original with him, and which is dependent upon the observation that that portion of the alkaloid which crystallizes with difficulty, or does not crystallize at all, from alcohol, and the decomposition products are more soluble in chloroform than the easily crystallizable part, and hence greater solubility of any specimen in chloroform indicates a greater portion of difficultly crystallizable salt, or more decomposition products, or both. The test is carried out as follows: A 40 cc. test-tube and dry cork are tared together, and into the test-tube 0.4 gram of the salt is put with 3 cc. of chloroform of a s. g. not below 1.47. After a thorough shaking, it will be seen whether much or little of the salt is dissolved. If much, 1 cc. more of chloroform is added; if little, only 0.5 cc., and so on, untill the salt is completely dissolved, or rather, until the liquid shows but faint opalescence, after standing. Having noted the amount of chloroform used, three times its volume of stronger ether, s. g. 0.728, is added, and the mixture is vigorously skaken. The mixture becomes milky, the salt eventually crystallizes out, and the clear liquid is then poured into a tared beaker, evaporated, dried at 100° C., and weighed: the test-tube, with contents and cork, being also dried at the same temperature to constant weight. To verify the tare of the latter it is rinsed out and again dried and weighed. The author regards that salt as typical that requires for 0.4 gram 9 cc. of chloroform for complete solution. Such typical salt is as free as is practicable from difficultly crystallizable salt and from decomposition products. The sum of the weights of the precipitate and residue obtained after treatment with ether, subtracted from the weight of the salt originally taken, gives the loss in the process, and this may safely be interpreted as water or moisture present in the original salt. Respecting the

Permanganate Test of Dr. Giesel (see Proceedings 1886, 621), the author regards it as hypercritical and often fallacious. The

Sulphuric Acid Test is of doubtful utility at the present time. The

Physiological Test, as here practiced, does not discriminate closely enough, and if it did it would not be of practical applicability in any general way. The

Acidity Test, by litmus paper, the author is inclined to consider of much importance when skillfully and critically applied. It is easy of application to strong solutions.—"Ephemeris," Jan. 1887, 906–931.

Hydrochlorate of Cocaine—Critical Examination of Different Tests.—Dr. Edward Polenske communicates some of the results of experiments to determine the value of Squibb's chloroform method (see above) for determining the character of hydrochlorate of cocaine. He finds that Squibb's method is of value only for the purpose of establishing the identity of the sample. To determine impurities that may be present, the direct agitation of the salt with ether of s. g. 0.725, evaporation of the ethereal solution, and examination of the residue of evaporation, leads to far more certain results. Regarding the solubility of the hydrochlorate of cocaine and of the salt of the amorphous alkaloid in chloroform, the author states that the difference between the amorphous salt and the crystallized salt containing water is not as great as given by Squibb. He finds that 0.4 gram of the amorphous salt requires 1.5 cc. chloroform, while for the same quantity of hydrated crystalline salt only 2.0 cc. are required. The anhydrous crystalline hydrochlorate, however, requires 6.5, but becomes just as soluble again on the addition of water sufficient to reproduce its previous hydrated condition.

Respecting the proposed test of Maclagan (see above), he has found it as stated by that author. The limit, however, is 4 per cent. of amorphous salts. In the presence of less than 4 per cent. no opalescence is observed. As regards Dr. Giesel's permanganate test, he does not believe it to be too exacting, since it detects only quantities of amorphous alkaloid from 1 per cent. upwards. One-half per cent. gives no reaction unless other organic impurities are also present.—Pharm. Rundschau, March 1887, 59–60.

Cocaine Hydrochlorate—New Test.—Mr. Henry Maclagan also does not consider the permanganate test a practical one (see above), and recommends the following which he accidentally discovered: If about one gram of hydrochlorate of cocaine be dissolved in about two fluid ounces of water, one or two drops of water of ammonia added, and the sides or bottom of the containing vessel rubbed with a glass rod, well marked striæ will appear where the rod has touched, and shortly after, flocks of precipitate will form and slowly subside, leaving the liquid bright and clear as at first. If amorphous alkaloid is present, even in moderately small proportions, no striæ nor precipitate will form, and the liquor will remain milky for a long time, the surface having a more or less oily appearance.—Amer. Drugg., Feb. 1887, 22.

Cocaine—Detection in the Animal Body.—Dr. L. Helmsing has investigated the detection of cocaine in the animal body. On giving 0.3 gm. of the hydrochlorate to a cat, which was strangulated after five hours, the alkaloid could be detected in the urine, blood, and all the organs. On decreasing the quantity of the alkaloid, the urine let by the animal gave distinct reactions, but those of the organs became fainter. There appears to be no doubt from the results of the experiments, that cocaine is decomposed in the body, and that the product of decomposition is dissolved from the alkaline urine by benzol, but not by petroleum benzin. The process of isolation was as follows: The substance was acidulated with sulphuric acid, the mixture agitated with petroleum benzin (benzol and chloroform likewise take up no alkaloid from the acid mixture), then rendered alkaline, agitated with benzol, and the solvent evaporated. The reagents employed were iodine, in potassium iodide, which gives a kermes-colored precipitate in solutions 1 : 100,000; and iodine water, which causes a violet color and turbidity, and if added in excess a kermes-colored precipitate, still distinct with .01 mg. of residue. Of the group reagents only potassio mercuric iodide and phospho-molybdic acid gave precipitates in solutions 1 : 100,000. Characteristic color reactions were not observed.—Thesis, Dorpat, 1886.

Cocaine—Use for Allaying Gastric Disturbances.—Dr. Dujardin-Beaumetz proposes to use cocaine to facilitate the operation of washing out the stomach, and also to quiet gastric pains. It is to be used according to the following formula: Water, 300 gm.; cocaine hydrochlor., 50 cgm.; dose, two tablespoonfuls every quarter of an hour, or until the cessation of pains or vomitings. In similar cases the following gives equally good results: Water saturated with chloroform, 150 gm.; tr. anise and illicium, of each, 5 gm.—Prog. Med., May 28, 1887.

Caffeine—Percentage in Different Samples of Raw Coffee.—Messrs. B. H. Paul and A. J. Cownley communicate the results of some experiments made to determine the percentage of caffeine in different specimens of raw coffee. Their method of determination consisted in mixing the finely powdered coffee with moist lime, extracting this mixture with boiling alcohol in a continuous extraction apparatus, evaporating the alcohol from the percolate, adding water and a few drops of dilute sulphuric acid to the residue, and filtering the cooled liquid. From this clear *acidulated* filtrate the caffeine is readily removed by shaking with chloroform, the pure alkaloid being obtained by simply evaporating the chloroform solution. Operating in this way, the author obtained the following results:

	Caffeine, per cent.
Coorg	1.10
Guatemala	1.18
Travancore	1.16
Liberian	1.20
"	1.28

These results were somewhat perplexing, in view of the great discrepancy of the published statements as to the amount of caffeine that is present in raw coffee, as will be seen from the following quotations:

	Caffeine in raw coffee beans, per cent.
Robiquet	0.32 to 0.64
Liebig	0.23 to 0.46
Zennek	0.75
Graham, Campbell and Stenhouse	0.88 to 1.00
Dragendorff	0.99 to 1.22
Squibb	1.00 to 1.03
Bell	1.08 to 1.11
Allen	0.50 to 2.00

The authors are convinced by these experiments that instead of a wide range in the amount of caffeine in different samples of coffee, the variation is really within very narrow limits. In point of fact, it was more nearly a constant quantity in those kinds of coffee beans they had an opportunity of examining.—Phar. Jour. and Trans., Jan. 5, 1887, 565.

Citrate of Caffeine—Character of Commercial Samples.—Mr. Otto Scherer records the results of some experiments made with five commercial samples of citrate of caffeine, which proved that four of the samples are simply caffeine, while the fifth, containing 45 per cent. of caffeine and 55 per cent. of citric acid, is regarded by the author as a definite compound, viz,, caffeine citrate.—Pharm. Era, March 1887, 69–70; from Proc. Mich. Pharm. Assoc., 1886.

Caffeine—Diuretic Effect.—The diuretic effects of caffeine, which have been previously observed by Zwenger, Gubler, Shapter, and others, have been the subject of investigation by Dr. von Schroeder, the results of whose experiments point to two opposite effects of caffeine:

(1) In stimulating the nervous system, similar to strychnine, and tending to decrease the flow of urine through the contraction of the renal vessels; and (2) in stimulating the kidney itself, and thus greatly increasing the amount of urine.—Arch. f. Path. u. Pharmak., Oct. 1886.

Experiments have also been made by Bronne in the same direction, which show that the diuretic action of caffeine varies considerably in intensity. He administered the alkaloid in divided doses every two hours, 0.5 to 1.5 gm. being the total amount, given in the morning only, so as to prevent it from causing sleeplessness; and if its employment must be prolonged, he advises its occasional discontinuance for a few days, when the remedy will act as promptly as before.—Amer. Jour. Phar., March 1887, 154; from the author's "Dissertation," Strassburg, 1886.

Caffeine and Theine—Differences in their Physiological Action.—Recent experiments made by Dr. Thos. J. Mays on frogs, confirm the observations made by Léven, in 1868, that theine produces convulsions in frogs, while caffeine does not. Dr. Mays draws the following conclusions: Theine and caffeine agree in the following—

1. They first affect the anterior extremities.
2. They diminish respiration.
3. They produce hyperæsthesia during the latter stage of the poisoning process.

They differ in the following—

1. Theine principally influences sensation, while caffeine does not.
2. Theine produces spontaneous spasms and convulsions, while caffeine does not.
3. Theine impairs the nasal reflex early in the poisoning process, while caffeine does not, if at all, until in the very last stage.
4. The lethal dose of theine is larger than that of caffeine.—Therap. Gazette, Sept. 1886.

Theine.—Estimation in *Tea*, which see under "Materia Medica."

Theine.—Method of extraction and percentage in *Tea*, which see under "Materia Medica."

Caffeïne-Methylhydroxide — Products of Decomposition at Elevated Temperatures.—In a former paper (see Proceedings 1884, 319–321), Mr. Ernst Schmidt had pointed out that caffeïne as well as theobromine are decomposed by fuming hydrochloric acid at temperatures not below 200° C., and that the products of decomposition are the same in both cases, viz., carbonic acid, formic acid, sarkosin, methylamine, and ammonia. In order to get a further insight into the constitution of these bodies, the author has since made a series of experiments with caffeïne methylhydroxide, a derivative of caffeïne which is readily obtained by acting upon caffeïne methyliodide with argentic oxide, his present paper detailing particularly his experiments respecting the product of the dry distillation of that body.

Caffeine-methylhydroxide constitutes colorless, feathery-grouped needles, which are readily soluble in water, in alcohol and in chloroform, but nearly insoluble in ether and in petroleum ether. Its solutions react neutral. Its formula is as follows: $C_8H_{10}N_4O_2\ CH_3OH + H_2O$. It melts at 90°–91° C. when of this composition, but in its anhydrous condition it melts at 137° to 138° C. When subjected to destructive distillation it does not yield methyl caffeine, but caffeine is again formed, the action being probably represented by the following equation: $C_8H_{10}N_4O_2.CH_3OH = C_8H_{10}O_4O_2 + CH_3.OH$. Methylamine and cholestrophan, which were determined during the decomposition, are probably formed by secondary reactions which require further study.—Arch. d. Pharm, 1886, 523–528.

Ethoxycaffeine—Physiological Action.—Ethoxycaffeine is caffeine in which one atom of caffeine has been replaced by oxyethyl (C_2H_5O). It forms white needle crystals, insoluble in water but slightly soluble in alcohol and ether. Dr. Dujardin-Beaumetz finds it to possess marked sedative powers, and a much more successful remedy in cases of sick headache than caffeine, or than guarana or paullinin, which owe their virtues to caffeine. Dr. Beaumetz advises a dose of 25 centigrammes (3¾ grains) to be taken as soon as the symptoms of an attack appear. He records several instances of remarkable relief following this dose, refreshing sleep being quickly induced. A larger dose than the above is liable to produce cramps of the stomach, with nausea, and the insolubility of the medicine is a difficulty in the way of its administration. He gives it either in powder, in wafers, or combined with salicylate of soda, which promotes its solubility, and hydrochlorate of cocaine, which moderates its effect on the stomach. The following is a draught recommended by Dr. Beaumetz:

Ethoxycaffeine	25 c. g.	= 4 grs.
Salicylate of sodium	25 c. g.	= 4 grs.
Hydrochlorate of cocaine	10 c. g.	= 1½ grs.
Aromatic water	60 g.	= 2 fl. oz.
Syrup of maidenhair	20 g.	= 5 fl. drm.

—Chem. and Drugg., July 1886, 54; from Bull. de Thérapeutique.

Colchicine—Characters and Composition.—Mr. S. Zeisel has made comprehensive experiments with a view to determine the characters and composition of colchicine. The seeds were extracted with hot 90 per cent. alcohol, the alcohol distilled from the tincture, the residue dissolved in water, separated from the fat, resin, and other insoluble matter, and then shaken out a number of times with chloroform. On evaporating the latter solution, a syrupy residue was obtained, from which rosette-shaped and globular aggregations of crystals separated after several days' standing. On examination these crystals proved to be a compound of colchicine with 2 mol. of chloroform, having the composition $C_{22}H_{20}NO_6$.

$2CHCl_3$. This compound constitutes faint yellow, needle-shaped crystals, which slowly lose chloroform. By exposing them for some time to the action of steam, passed directly over the substance contained in a flask, the chloroform is completely removed, and the aqueous liquid resulting yields pure colchicine in evaporation. Colchicine constitutes a yellowish-white powder, becoming darker when exposed to light, but not when protected from its influence. It has the composition corresponding to the formula $C_{22}H_{25}NO_6$, is a feeble base, incapable, in the author's experience of yielding simple salts direct from aqueous solutions, but readily forming the auro-chloride, which has the composition $C_{22}H_{25}NO_6HCl.AuCl_3$. By boiling with dilute hydrochloric or sulphuric acid it is converted into colchiceïne, which is obtainable in form of small white, needle-shaped crystals, methyl-alcohol being a by-product. Colchiceïne is also a feeble base, and the author has obtained a soluble salt—the auro-chloride—having the composition $C_{21}H_{23}NO_6.HCl.AuCl_3$.—Arch. d. Phar., Feb. 1887, 184; from Monatsh. f. Chem., 7, 557.

Colchicine—Characteristic Reaction with Sulphovanadate of Ammonium, which see under "Inorganic Chemistry."

Colchicine—Toxicity.—Some important researches as to the toxicity of colchicine are given in the Jour. de Méd.: 1. The symptomatic tables, and the microscopic aspects, show that colchicine acts as an irritant poison, powerful enough to make its action felt in all the organs, but whose predominating influence is exerted upon the digestive tract and the kidneys. 2. The minimum toxic dose varies according to the mode of administration. Hypodermically it is 0.000571 gm.; by the stomach, 0.00125 gm. per kilo. of the living body. 3. The toxic action is more rapid in hypodermic injections. 4. It is eliminated by many emunctories—especially by the kidneys—but the work is slow; hence, non-toxic and relatively weak doses (0.00016 gm.) per kilo of body weight, may cause death in five days. 5. It congests the articular extremities and the medulla osseum. 6. In therapeutic doses it acts as a purgative or diuretic (according to strength), in consequence of its congestive and irritative action on the kidneys and the digestive tract. 7. Man is three times more sensitive to its action than cat or dog. Diuresis is caused by 2 or 3 millig'm, and purgation by 5 millig'm. 8. It augments the excretion of uric acid, and diminishes its quantity in the blood. Its extremely toxic nature suggests great caution in its use.—Amer. Jour. Phar., June 1887, 297.

Alkaloids of Jaborandi—Constitution.—Mr. E. Harnack has already in a former communication (see Proceedings 1881, 347,) pointed out the possibility that pilocarpine, which in its action possesses great similarity to nicotine, is also chemically nearly related to the latter, and that from this standpoint it may be regarded as double hydroxylated methyl-nicotine. He now describes a new base, which stands as it were between the two alkaloids. It has the composition $C_{10}H_{14}N_2O_2$, therefore does not contain the two methyl-groups assumed in pilocarpine, but contains two atoms of oxygen which nicotine does not contain. The author, who obtained the new base in considerable quantities, proposes for it the name

Pilocarpidine. It constitutes a colorless, syrupy, strongly alkaline mass, exhibiting a strong tendency to crystallize, but is exceedingly hygroscopic, and becomes gradually yellow when exposed to light. The sulphate and hydrochloride are also hygroscopic, but the nitrate is readily obtainable in colorless columnar crystals, often an inch long, and resembling nitrate of potassium. A characteristic distinction from pilocarpine consists in the fact that the aqueous solutions of its salts are *not* precipitated by auric chloride. Its pharmacological action is similar to but considerably weaker than that of pilocarpine.—Arch. d. Phar., May 1887, 453; from Liebig's Annalen, vol. 238, 228.

Pilocarpine—Compounds and Decomposition Products.—Messrs. E. Hardy and G. Calmels have studied the compounds of pilocarpine.

Pilocarpine Nitrate, $C_{11}H_{16}N_2O_2.HNO_3$, form rhombic lamellæ, very soluble in water, but less soluble in alcohol.

Pilocarpine Platino-chloride, $(C_{11}H_{16}N_2O_2)_2H_2PtCl_6$, forms quadratic prisms and lamellæ, which are somewhat soluble.

Modified Pilocarpine Platino-chloride, $(C_{11}H_{16}N_2O_2)_2PtCl_4$, forms a yellow crystalline powder, which is very soluble.

Pilocarpine Auro-chlorides.—There are four compounds, viz: $C_{11}H_{16}N_2O_2.AuCl_3$, formed in slender needles, when the pilocarpine is in excess; $C_{11}H_{16}N_2O_2.2AuCl_3$, obtained in microscopic needles when the auric chloride is in excess; the acid auro-chloride, $C_{11}H_{16}N_2O_2.HAuCl_4$, obtained in needles by adding a limited quantity of auric-chloride to a solution containing free hydrochloric acid; and the acid diauric chloride, $C_{11}H_{16}N_2O_2.2HAuCl_4$, obtained in needles or right rectangular prisms by adding excess of auric chloride in presence of hydrochloric acid.

Pilocarpine Mercuro-chlorides are very soluble in acids.

Pilocarpine itself is a viscous substance, very soluble in water and in alcohol, slightly soluble in ether and in chloroform, more readily in the latter when heated, and readily when these are mixed with alcohol. Pilocarpine does not act on carbonates, but with alkaline hydroxides it forms compounds which are decomposed by carbonic acid. These facts point to the presence of an internal anhydride, but

Pilocarpic acid does not exist in a free state. The copper salt $(C_{11}H_{17}N_2O_3)_2Cu$, is a slightly soluble green powder; the silver salt forms a curdy precipitate. By the action of nitric or hydrochloric acid, or by boiling pilocarpine or its salts with water in presence of air.

Pilocarpidine is produced. The salts of this base are similar to those of pilocarpine, a number of them being described.—Compt. Rend., cii., 1116, 1119; Jour. Chem. Soc., Aug. 1886.

Jaborine—Preparation, etc.—Messrs. Hardy and Calmels state that if carefully dried pilocarpine is heated rapidly to 175°, kept at this temperature for about half an hour, and the product extracted with water made alkaline with baryta, and shaken with ether, the ether contains jaborine, and the aqueous solution contains pilocarpidine and jaboric acid. *Jaborine* separates from alcohol or ether in a brown mass, which changes to a brittle, resinous solid. It is insoluble in water, but dissolves readily in ether, and is also soluble in jaboric acid. From solutions of the hydrochloride it is thrown down by potash as a curdy precipitate, which readily agglomerates under warm water. When boiled with concentrated aqueous potash it is converted into pilocarpidine. The hydrochloride is extremely soluble in water and alcohol. When boiled with excess of hydrochloric acid, it is converted into pilocarpidine hydrochloride. Solutions of jaborine are brown, with a greenish fluorescence, which is not completely removed by animal charcoal.

Jaboric acid is separated from pilocarpidine by precipitating with excess of silver nitrate, which forms a curdy precipitate of the composition $C_{19}H_{24}N_3O_6Ag,AgNO_3$. Jaboric acid resembles jaborine in appearance, but is very soluble in water, and is not removed from its aqueous solution by ether. With alkalies it forms gummy salts, which dissolve in water and alcohol, and are not decomposed by carbonic anhydride.—Amer. Jour. Phar., Nov. 1886, 568–569; from Compt. Rend. cii.

Alkaloids of the Berberideaceæ.—Dr. O. Hesse is engaged in the study of the alkaloids occurring in the *Berberideaceæ*. . Barberry root he finds to contain at least 4 alkaloids besides the well-known berberine. The mother-liquor from hydrochlorate of berberine when precipitated with soda yields to ether, besides oxyacanthin, two other alkaloids, and a fourth, which is amorphous, remains undissolved. One of the two alkaloids in the ethereal solution crystallizes from alcohol in small tabular crystals, is named by the author *Berbamine*. It has the composition corresponding to the formula $C_{18}H_{19}NO_3 + 2H_2O$.—Arch. d. Phar., March, 1887, 258; from Ber. d. D. Ch. Ges., 19, 3190.

Berberine—Characters, Salts, and Decomposition Products.—Prof. E. Schmidt and Mr. C. Schilbach have made comprehensive experiments to determine the characters of berberine, its salts, and its products of oxidation. Regarding the alkaloid itself, Professor Schmidt expresses the opinion that this has not hitherto been obtained in a perfectly pure condition, and that for this reason the analytical results of different experimenters have been so variable. These variable results are in part also due to the liability of the free alkaloid to undergo change when dried at 100°. In a future paper he promises to discuss the methods by which he has succeeded to secure the alkaloid in a well-crystallized condition, confining himself in the present paper to giving the details of experiments made jointly with Mr. Schilbach, upon its compounds, etc.

Berberine-Chloroform.—One of the most interesting results of the experiments was the production of a compound which Prof. Schmidt preliminarily designates as "berberine-chloroform," it being a compound of equal molecules of berberine and chloroform = $C_{20}H_{17}NO_4.CHCl_3$. It was obtained by treating the solution of a berberine salt with hydrate of baryta in excess, shaking out with chloroform, distilling off the chloroform, washing the amorphous yellowish residue with cold alcohol, dissolving the now powdery residue in chloroform, and mixing the solution with an equal volume of alcohol. The new compound crystallizes out in splendid, *colorless*, strongly glistening, tabular crystals. While easily dissolved in chloroform, it is almost insoluble in water and in alcohol. It gradually becomes yellow on keeping, does not lose weight at 100°, but is changed in color, becomes brown at 170°, and melts with frothing at 179°. These characters, as well as its behavior with acids, show this compound to be not a simple mixture of the components, nor a molecular combination of the two substances as such, but resembles, in its character, acetone-chloroform, obtained by Willgerodt by the action of potassium hydrate upon a mixture of acetone and chloroform. Another interesting compound obtained by the author is

Berberine-Hydrogenhexasulphide.— A similar, or possibly identical compound, has already been noticed by Fleitmann, but was not subjected by him to nearer examination. Prof. Schmidt obtained this compound by adding yellow sulphide of ammonium to an alcoholic solution of the hydrochlorate or sulphate of berberine, moderately heated. The compound separates in form of velvet-brown, shining, needle-shaped crystals, which are obtained pure by washing with alcohol. It readily undergoes decomposition. Its composition corresponds to the formula $(C_{20}H_{17}NO_4)_2H_2S_6$. By the action of nascent hydrogen upon berberine,

Hydroberberine, $C_{20}H_{21}NO_4$, which has already been described by Hlasiwetz and by Von Gilm, is obtained. Prof. Schmidt's results add very little to the observations, respecting its preparation and character, already made by these experimenters. The salts of berberine have been specially studied by Dr. Schilbach. After enumerating the plants in which berberine has hitherto been recognized as a constituent, he gives the methods employed for the preparation of the *nitrate*, *sulphate*, *hydrochlorate*, *aurochlorate*, and *platinochlorate*, together with the results of their ultimate analyses. Finally, the authors have jointly studied the products of the action of permanganate of potassium upon berberine. They have so far isolated two oxidation products. One of them is *hemipinic acid*, which agrees very well with the hemipinic acid obtainable by the oxidation of narcotine. The second product, which is also an acid, but distinct from hemipinic acid, requires further examination.—Arch. d. Phar., Feb. 1887, 141–181.

Emetine—Estimation in Ipecacuanha and its Preparations.—Mr. Henry Williams Jones has found the method of Professor Flückiger (see Proceedings 1886, 424) to be an excellent one for the estimation of emetine in ipecacuanha, as well as, with certain modifications, in its preparations. The process consists in exhausting the drug, in the state of a fine powder, in a Soxhlet's tube, or similar apparatus, with chloroform and a small amount of ammonia. Mr. Jones prefers treating the residue from the chloroformic solution with water and dilute sulphuric acid, filtering through cotton-wool, and recovering the alkaloid by means of chloroform and ammonia. The emetine is thus obtained in a pure condition, suitable for weighing, and, as the author has convinced himself by experiment, in an unchanged condition.

The author has also obtained excellent results, identical with the above, by a combination of the lime and chloroform method. He prefers in this to exhaust the ipecacuanha with water, acidulated with sulphuric acid, treating the solution with excess of lime, evaporating to dryness, exhausting the residue with strong alcohol, distilling off the alcohol, taking up the emetine from the residue by water acidulated with sulphuric acid, and then removing the emetine from this by chloroform and ammonia. This method is equally applicable to the estimation of emetine in the different preparations of ipecacuanha, such as the wine for instance, the preparation being evaporated to dryness with lime, and the dry residue treated as above.

When a limited supply only of the drug is at command, it is preferable to determine the emetine gravimetrically, but under other conditions the volumetric method, with Mayer's reagent, will answer well with certain corrections. There are just two causes that are likely to affect the result. The first is the presence of substances other than emetine; the second, the varying amount of alkaloid in the solution. The first obstacle is removed by securing pure emetine by one or the other of the above methods. The second is overcome by the corrections proposed by the author, which are based upon his careful experiments. It is stated in a general way that the solution to be titrated should contain 1 p. alkaloid in from 250 to 500 p. Operating with faintly acid solutions, the author found that pure emetine (the preparation of which he describes) requires to be present in the proportion of 1 to 530 to give exact results. In more concentrated solutions the indications of the amount of alkaloid decrease, as is shown by the following table of actual experiments:

	Anhydrous emetine taken.	Volume of emetine solution.	Amount of Mayer's solution required.	Emetine indicated by the experiment.
1	0.1421 gram	10 cc.	6.2 cc.	0.1171
2	0.1421 "	30 cc.	6.4 cc.	0.1209
3	0.1421 "	50 cc.	7.0 cc.	0.1323
4	0.0945 "	10 cc.	4.2 cc.	0.0793
5	0.0945 "	50 cc.	5.0 cc.	0 0945
6	0.0945 "	100 cc.	5.4 cc.	0.1020

The author believes that for practical purposes, and in cases where the solution has been freed from extraneous matter, as far as possible, it may be assumed that the error due to dilution or concentration decreases or increases in a regular order, and that the following table constructed by him may be safely used for the correction of the errors resulting from the sources named. He advises the use of 10 grams of the drug, so as to get sufficient solution for several trials if necessary. Column I. in the table shows the ratio of alkaloid to the solution. Column II. gives the factors necessary for correction. The apparent amount of alkaloid in the solution undergoing test is determined by dividing the volume of the solution by the amount of emetine found by Mayer's reagent. In determining volumetrically the emetine in the dry chloroformic residue obtained by Flückiger's process, it will be found convenient to make the solution of such strength that the alkaloid of 10 grams of root will be contained in 25 cc., dissolving with the aid of a few drops of dilute sulphuric acid:

I.	II.	I.	II.	I.	II.
1:50	1.240	1:210	1.160	1:370	1.080
60	1.235	220	1.155	380	1.075
70	1.230	230	1.150	390	1.070
80	1.225	240	1.145	400	1.065
90	1.220	250	1.140	410	1.060
100	1.215	260	1.135	420	1.055
110	1.210	270	1.130	430	1.050
120	1.205	280	1.125	440	1.045
130	1.200	290	1.120	450	1.040
140	1.195	300	1.115	460	1.035
150	1.190	310	1.110	470	1.030
160	1.185	320	1.105	480	1.025
170	1.180	330	1.100	490	1.020
180	1.175	340	1.095	500	1.015
190	1.170	350	1.090	510	1.010
200	1.165	360	1.085	520	1.005

—Pharm. Jour. and Trans., Oct. 2, 1886, 277-279; Yearbook of Phar., 539-546.

Emetine—Chemical Constitution and Analogy to Quinine.—Mr. H. Kunz, after referring to the close botanical relations of the plants yielding emetine and quinine, gives the details of some experiments which show an equally close analogy in the chemical constitution of the two alkaloids. The author concludes from his results:

I. That emetine has the molecular formula: $C_{30}H_{40}N_2O_5$, and yields a platinum double salt of the composition: $C_{30}H_{40}N_2O_5.2HCl+PbCl_4$.

II. Emetine is according to this a *bin-acid* base, like quinine, and

III. A *diamine*, and, moreover, like quinine, a *tertiary diamine*, since it yields, upon addition of methyl, an ammonium base, the *methylemetoniumhydrate* $= C_{30}H_{40}(CH_3)N_2O_5.OH$.

IV. It is quite likely that emetine, like quinine, is a derivative of *chinoline*.

V. Ipecacuanha root contains, besides emetine, *bilineurine* or *choline* $= C_5H_{15}NO_2$.—Arch. d. Phar., June 1887, 461, 479.

Sulphate of Sparteïne—Physiological Action.—Dr. Voigt gives an account of the experience of the use of sulphate of sparteine in the clinic of Prof. Nothnagel, and confirms most of the views of Sée (see Proceedings 1886, 629), Laborde and Legris. It stimulates and regulates the heart, the pulse becomes stronger, and the arterial tension is increased. It may be used in valvular disease where there is disturbed compensation, or to quiet irregular action even where the compensation is fairly good. It may likewise be given where, apart from valvular disease, the heart muscle is weak. Laborde and Legris advised $\frac{3}{4}$ to $3\frac{3}{4}$ grains in 24 hours. Voigt recommends doses of $\frac{1}{60}$ to $\frac{1}{30}$ of a grain only. He has known vertigo, headache, palpitation, and nausea follow $\frac{1}{60}$ to $\frac{1}{15}$ of a grain, but these symptoms are only transient, and do not prevent the continuance of the drug. Sometimes a slight narcotic action is observed. Sparteine acts quickly. The effect of one dose may last twenty-four hours. It is well to intermit its administration every few days. The influence, though quickly exerted, is not prolonged enough, Voigt thinks, to remove grave disturbances of the compensation. Repeated doses do not regulate the heart continuously like digitalis, but it is superior to caffeine, Adonis vernalis, and convallamarin. It may be given in combination with digitalis.—Wien. Med. Blätter, 1886, Nos. 25 and 27.

Ulexine—A New Base from Ulex Europæus.—Mr. A. W. Gerrard has isolated a new base from the seeds of *Ulex europæus*, commonly called furze-, gorze-, or whin-seed, and, after a description of the process of extraction, gives the following characters of the new substance:

Ulexine forms colorless, odorless crystals, with a bitter and somewhat pungent taste; it is freely soluble in water, forming a strongly alkaline solution. Heated, it fuses, darkens and decomposes, giving off vapor that burns with a yellow smoky flame, and leaves no residue. Small portions placed on watch glasses gave, with nitric, hydrochloric, hydrobromic, sulphuric and oxalic acids, in a few hours, well crystallized salts.

The salts appear to be freely soluble in water, very strong solutions of them giving precipitates with caustic potash and soda soluble in excess, but they give no precipitate with ammonia. Ten per cent. solutions of the carbonates of potassium, sodium and ammonium, or of the iodide, chromate and ferrocyanide of potassium, give no precipitates; permanganate of potassium is almost immediately reduced by it. Picric acid gives a yellow precipitate; chromic acid no precipitate. Brought in contact with strong nitric, sulphuric or hydrochloric acids, no reaction is apparent. The watery solution of the pure base gives a green precipitate with ferrous sulphate, a black precipitate with mercurous nitrate, and a white precipitate with mercuric chloride. Ulexine appears to act on frogs as a paralyzing agent, causing clonic spasms; placed on the tongue the chloride produced a slight numbness, similar to, but not nearly so powerful as cocaine. Knowing that many animals feed readily on the furze plant, it may be inferred that the alkaloid is not of a powerful or poisonous nature; but this idea must not be too hastily accepted, until we obtain precise evidence as to its action, for we know that some poisonous plants are eaten by animals without ill effect.—Pharm. Jour. and Trans., Aug. 7, 1886, 101.

Ulexine—Method of Preparation.—In his above paper, Mr. Gerrard had given a method for the preparation of ulexine, which he has since improved upon, securing thereby a larger yield. The process now carried out by him was as follows:

Twelve kilograms of crushed furze seed were percolated to exhaustion with 84 per cent. alcohol; the percolate on distillation gave 916 grams of extract, which separated on standing into a porous extract intermixed with much fixed oil. The extract was warmed and well shaken with six successive liters of 1 per 1000 hydrochloric acid; the separated mixed acid fluids were carefully made neutral with sodium carbonate, and evaporated to 1 liter. On setting this aside for twenty-four hours it deposited much resin, from which the clear liquid was decanted and further evaporated to 500 cc. and when cold treated with excess of carbonate of soda, then shaken well with three successive portions of chloroform. The separated and mixed chloroform was well shaken with dilute hydrochloric acid, during which operation a portion of the hydrochlorate of ulexine formed developed a peculiar milkiness in the chloroform, and was overcome by the addition of warm water, which caused a complete separation. On evaporation of the separated aqueous solution the hydrochlorate of ulexine was obtained in crystals. The yield of ulexine by this process was 0.191 per cent., an increase of 33 per cent. over the author's former yield. Ulexine was also obtained, though in smaller quantity, from the bark and young tops of furze. As to

Salts of Ulexine, the author obtained the finest crystals by the nitrate, hydrochlorate, hydrobromate, sulphate, and platino-chloride. The

Nitrate of Ulexine crystallizes from water in large, oblique prisms, some of which are more than a centimetre in length; it is soluble in 10 parts of water, but almost insoluble in alcohol. The

Hydrochlorate of Ulexine also forms prisms, but is more soluble in water and in alcohol than the nitrate. The

Platino-chloride is readily obtained in fine crystals. It is made by mixing solutions of the two chlorides, re-dissolving the abundant yellow precipitate by warming gently, and allowing the solution to cool.

Searching for a reagent to distinguish ulexine from other alkaloids, ferric chloride was found to give a deep red color with the pure base as well as all its salts. A small particle of the solid alkaloid or salt is placed on a white porcelain surface, and a small drop of the ferric chloride is brought in contact with a glass rod. Another characteristic of the base is its extreme solubility in water, its own weight only being required. It is quite insoluble in pure ether. Yearbook of Pharm., 1886, 459–461.

Ulexine—Physiological Action.—Dr. Pinet has experimented with ulexine, the alkaloidal constituent of *Ulex europæus*, Lin., originally isolated by Gerrard (see above). It produces convulsions resembling those following nicotine, then sleepiness and cessation of respiration; it appears to affect the nervous, but not the muscular system. It is not an antidote to strychnine, its effects being rapidly produced, but not lasting.—Arch. Physiol., 1887.

Hymenodictyonine—Action of Iodine, Bromine, and Oxidizing Agents.—Mr. W. A. H. Naylor, in continuation of his former investigations of hymenodictyonine (see Proceedings 1883, 137; 1884, 166; and 1885, 333) has directed his efforts towards gaining some knowledge of its behavior when acted upon by iodine, bromine and oxidizing agents, and has communicated an outline of the working details and the results to the Br. Pharm. Conference (1886). His endeavor to obtain an iodine derivative of the alkaloid in a crystalline form was unsuccessful; he obtained, however, an amorphous body, the composition of which corresponds very closely with the formula $(C_{23}H_4N_2)_2I_3,2H_2I$. The attempt to obtain a crystalline bromine derivative was attended with similar failure. The action of oxidizing agents upon the alkaloid indicates that, in common with the other non-oxygenated alkaloids, hymenodictyonine is constitutionally related to pyridine.—Yearbook of Pharm., 1886, 439–441.

Lobeline—Characters, etc.—See *Lobelia inflata* L., under "Materia Medica."

Parthenine—Medicinal Doses.—It is stated in "Rundschau" (Prag, xii, 855) that parthenine (see Proceedings 1886, 416) when given in doses of from 1 to 20 centigrams, aids digestion; in larger doses it slightly reduces the temperature of the blood, but has no effect on the secretion of urine. It has a bitter taste.

Asimine—A New Alkaloid from Asimina triloba (Paw-paw), which see under "Materia Medica."

Tulipiferine—A New Alkaloid in the Bark of Liriodendron Tulipifera, L., which see under "Materia Medica."

Ustilagine—A New Alkaloid from Ustilago Maydis, which see under "Materia Medica."

Carvylamine—A New Base from Carvol, which see.

Coniine—Synthesis of an Active Base.—Prof. A. Ladenburg in continuation of his former experiments (see Proceedings 1886, 633), has operated on a larger scale and with pure materials, and obtained results which are confirmatory of those previously obtained.

a-Allylpyridine, boils at 187.5—192.5°, and is a strongly refracting liquid of sp. gr. 0.9595 at 0°, sparingly soluble in water, and having a distinct conyrine-like odor. The *platinochloride* $(C_3H_5.C_5H_4N)_2,H_2PtCl_6$, melts at 185—186°, and crystallizes in needles sparingly soluble in water. The *aurochloride* melts at 135—136°; the mercuriochloride and cadmio-iodide are also described. By the action of sodium on an alcoholic solution at the boiling point, *a*-allylpyridine is reduced almost quantitatively to *a-propylpiperidine.* This base has a sp. gr. 0.8626 at 0°, and boils at 166—167°; its hydrochloride crystallizes in white, silky needles, melting at 203—205°. In smell, solubility, specific gravity, and physiological action, *a*-propylpiperidine resembles conine, and not only are the platinochlorides, aurochlorides and cadmio-iodides similar, but when *a*-propylpiperidine is converted into conyrine by Hofmann's method, a blue fluorescence is obtained, just as with conine. This fluorescence is due to an accompanying product, for if the fluorescent base after separation from unaltered conine be converted into the platinochloride, the conyrine regenerated from it is no longer fluorescent. Conyrine platinochloride from conine crystallizes in monoclinic forms: $a : b : c = 1.0614 : 1 : 1.5374$; $\beta = 87° 8'$; and the crystals from the synthetical base give practically the values on measurement.

a-Propylpiperidine, however, in addition to the lower melting point of its hydrochloride, is optically inactive, and must be regarded as a physical isomeride of conine. To effect a separation into two optically active bases, a sterilized nutritive solution containing 0.5 per cent. of the tartrate was seeded with *Penicillium glaucum*, but without result. The active base, however, was obtained by introducing a crystal of the salt into a very concentrated solution of *a*-propylpiperidine hydrogen tartrate; a slow separation of crystals took place, which yielded a dextrorotatory base, whose specific rotation was $[a]_d = 13°87'$, compared with $[a]_d = 13°79'$ for conine. The hydrochloride of the synthetical active base melts at 217.5°, that of conine at 217.5—218.5°.

From the mother-liquor, a lævorotatory base was obtained, but it contained a large proportion of the dextrorotatory modification, which could not be further separated by the crystallization method. However, on converting this lævorotatory mixture into the cadmio-iodide, it was found that after crystallization, the crystallized salt yielded a base which was less lævorotatory than before, whilst from the mother-liquor a base was obtained, which in a 50 per cent. alcoholic solution gave a rotation of —3°30′ in a decimetre tube, compared with 3°10′ for conine under the same conditions.—Berichte D. Ch. Ges., 1886, 2578.

Coniine—Review of the Experiments Resulting in its Synthetical Production.—Dr. C. Stoehr contributes a highly interesting paper on the synthesis of coniine, in which he reviews the different experiments that have from time to time been made with this in view. He regards it almost beyond doubt that Ladenburg's recent investigations have resulted in the synthesis of coniine that is absolutely identical with natural coniine, the only point remaining to be investigated being the relation of the synthetical compound to polarized light. In all other respects the identity appears to be established. As regards the salts of coniine, the author observes that contrary to the usually accepted opinions, they are perfectly stable compounds provided they are prepared from pure material.—Arch. d. Phar., Aug. 1886, 689–701.

Choline—Presence in Ipecacuanha Root and in Indian Hemp, etc.—In his paper on "Emetine" (which see) Mr. H. Kunz draws attention to the fact that choline is one of the constituents of ipecacuanha root. Mr. E. Jahns has also determined choline to be the alkaloidal constituent of Indian hemp (which see), no other base having been detected by him. He observes that choline seems to be widely distributed, it having been determined by Harnack in *Boletus luridus;* by Böhm in *Amanita pantherina*, in *Helvella esculenta*, in beech nuts and in cotton seeds; by Gries and Harron in hops and in beer, and by the author in hyoscyamus, belladonna, in hempseed, lentils, etc.—Arch. d. Pharm., June 1887, 483.

Choline—Source of Trimethylamine in Ergot.—Dr. L. Brieger has determined that trimethylamine does not exist ready formed in ergot, as is assumed by some authors, though disputed by others. He finds that it is the product of the decomposition of the choline contained naturally in the ergot.—Arch. d. Pharm., June 1887, 502; from Zeitschr. f. Physiol. Chem., xi, 184.

Ptomaïnes and Leucomaïnes—Characters, etc.—Mr. A. Gautier gives a *résumé* of the work done on these alkaloids. From the muscle of large animals he has succeeded in obtaining five new alkaloids (leucomaïnes), perfectly definite in composition and crystalline form, which, when administered to animals, act more or less powerfully on the nerve centres, inducing sleep, and in some cases causing vomiting and purging, in a manner similar to the alkaloids of snake poison, but less powerfully than the ptomaïnes. These bases are formed during life, and occur in the urine, saliva, venom, and various glandular secretions, but the author has more particularly studied their occurrence in muscle.

Xanthocreatinine, $C_5H_{10}N_4O$, is the most abundant of the bases obtained from muscle. It consists of light sulphur-yellow spangles with a slightly bitter taste. The crystals are very soluble in water and soluble in alcohol. They slowly blue reddened litmus-paper, and redden the blue paper. The hydrochloride is obtainable. The platinochloride is very soluble, and crystallizes in long sheaves. The aurochloride is difficult to obtain in the crystalline form. The substance closely resembles creatinine. This resemblance, together with its yellow color, is indicated in its name.

Crusocreatinine, $C_5H_8N_4O$, is decidedly alkaline to test-paper, and gives a soluble non-deliquescent hydrochloride, and a soluble platinochloride. The slightly soluble aurochloride occurs in crystalline grains. This base neither precipitates zinc from its acetate nor mercury from its nitrate, but it precipitates alumina from alum solutions. It strongly resembles creatinine.

Amphicreatinine, $C_9H_{19}N_7O_4$, occurs in small quantity only. It is a feeble base, forming a non-deliquescent crystalline hydrochloride. Its platinochloride is soluble in water, insoluble in alcohol, and forms lozenge-shaped plates. Its aurochloride forms very soluble, microscopic, hexahedral and tetrahedral crystals.

Pseudoxanthine, $C_4H_5N_5O$.—The alcoholic mother-liquors from the preceding compounds are freed from alcohol, the residue is taken up with water, and treated with copper acetate in slight excess. On heating, a precipitate is obtained from which the copper is separated by means of hydrogen sulphide. On filtering the boiling solution, a light sulphur-yellow powder is obtained. The substance readily forms a very soluble hydrochloride. It is similar to xanthine, except that it is slightly more soluble, and there is a little difference in the crystalline form. The author has also obtained two other bases of the composition $C_{11}H_{24}N_{10}O_5$ and $C_{12}H_{25}N_{11}O_5$ respectively, whose reactions show their close relation to creatinine. During the writing of this paper, Brieger has described a very poisonous leucomaine, of the composition $C_6H_{15}NO_2$, obtained from poisonous muscle, which he calls *mytilotoxine.*—Jour. Chem. Soc., July 1886, p. 634; J. Pharm. [5], xiii, 354–360, and 401–409.

Ptomaïnes—Difficulty of Detecting Poisonous Alkaloids Owing to their Formation, etc. — Mr. H. Beckurts observes that the detection of poisonous alkaloids in forensic and similar cases is greatly increased in difficulty owing to the formation of ptomaïnes from albuminoid substances of animal or vegetable origin, more especially as the ptomaïnes in their general chemical reactions bear great resemblance to the vegetable alkaloids. It has repeatedly occurred in criminal cases, that the two classes of compounds have been confounded, even by experts. All the basic nitrogenous products which result from the action of bacteria, whether of disease or decomposition, must be considered as ptomaïnes; and perhaps also certain definite poisonous basic substances, the leucomaïnes, which according to Gautier are formed during life in man and the higher animals. It is mainly to Brieger's investigations during the past four years, that we are indebted for a more accurate knowledge of the composition of these compounds. From decomposing flesh, Brieger obtained *neuridine*, $C_5H_{14}N_3$, and *neurine*, $C_5H_{13}NO$. From decomposing fish he obtained a poisonous isomeride of ethylendiamine, possibly *ethylidenediamine*, $C_2H_4(NH_2)_2$, *muscarine*, $C_5H_{15}NO_3$, and the physiologically inactive *gadinine*, $C_6H_{17}NO_2$. Fully decomposed cheese yielded neuridine. Decomposing glue gave neuridine, dimethylamine, and a muscarine-like base, whilst rotten yeast gave *dimethylamine* only. As these compounds result from the action of bacteria on animal tissues, so Brieger showed that the same or analogous compounds were similarly formed in the human subject. In the earlier stages of decomposition, only *choline* was found. After three days, neuridine appeared in increasing amounts, whilst choline gradually disappeared, being replaced by trimethylamine. After fourteen days, neuridine had also disappeared. Later, there most commonly appeared *cadaverine*, $C_5H_{16}N_2$, and *putrescine*, $C_4H_{12}N_2$. With cadaverine is also found a substance of the same composition, called *saprine*, but differing considerably in its reactions. The bases choline, neuridine, cadaverine, putrescine and saprine are physiologically indifferent; but after fourteen days' decomposition a new poisonous base, *mydaleine*, was obtained which seems to be a diamine. In human remains (heart, lung, liver, etc.), maintained at —9 to + 5° C. during four months, a new base, *mydine*, $C_8H_{11}NO$, was found, a strongly reducing agent, and a poisonous base, *mydatoxine*, $C_6H_{13}NO_2$, also the poisonous *methyl-guanidine* was isolated. The bases obtained by Brieger are either liquids of definite boiling point, or solid crystalline substances. The salts show the so-called general alkaloid reactions, so that as a group the ptomaïnes cannot be separated from the alkaloids. The non-poisonous ptomaïnes readily give rise to poisonous compounds; thus, cadaverine, which has been shown by Ladenburg to be *pentamethylenediamine*, is converted by rapid distillation of the hydrochloride into the poisonous *piperidine*. Whilst the constitution of cadaverine has just been indicated, putrescine is either a dimethylethylendiamine or methylethyl-methylendiamine; which of the two, further investigation must decide. The present methods of isolating the alkaloids do not yield absolutely certain results, and further extended investigation is required.—Arch. d. Pharm., Dec. 1886, 1041–1065; Am. Jour. Phar., 1887, p. 253.

Ptomaïnes—Influence upon the Reactions of Plant Alkaloids.—Mr. K.

Tamba has studied the formation and forensic determination of the alkaloids of putrefaction, as well as their separation from vegetable alkaloids and the extent to which they interfere with the well-known reactions of the latter. He has in the latter direction obtained in the main very satisfactory results, the reactions pertaining to the natural alkaloids being in many instances obtainable in the presence of ptomaïnes, though in other cases they are completely masked. The alkaloids and other principles experimented upon were the following: Morphine, strychnine, brucine, veratrine, atropine, narceine, colchicine, codeine, aconitine, digitalin, picrotoxin, delphinine.

On the whole, he considers it advisable to separate the ptomaïnes from plant alkaloids, and he communicates the results of experiments which have led to a reliable method for their removal in such connection, which see in Arch. d. Pharm., May 1887, 408–410, from the author's Thesis.

Cadaverine—Identity with Pentamethylendiamine.—Prof. A. Ladenburg has determined that *cadaverine*, the alkaloid isolated by Brieger from human cadavers, and having the formula $C_5H_{14}N_2$, is identical with the *pentamethylendiamin* first prepared by the author. He has also succeeded in converting Brieger's cadaverine into piperidine.—Ber. d. D. Ch. Ges., 19, 2585.

Phenol-Urea—A New Compound.—Dr. Hugo Eckenroth draws attention to a new compound—phenol-urea—which he incidentally noticed during the synthetical preparation of urea by the method of Hentschel. The new compound is exceedingly unstable, being decomposed into phenol and urea by simple solution in water, alcohol, or ether. It is obtained very readily, however, in a perfectly pure, well-crystallized condition, as follows: Diphenyl-carbonate (carbonic-phenyl ether), purified by recrystallization from alcohol, is dissolved in a little boiling alcohol, and spirit of ammonia is added in equivalent quantity, and gradually. The mixture is digested until the odor of ammonia has completely disappeared. After a time crystals of the new compound will separate in form of colorless, glistening leaflets, which are separated from the mother-liquor by suction, and finally by pressure between blotting-paper. Phenol-urea exhibits all the reactions of its two components. Exposed to air the compound loses a portion of its phenol. Its composition corresponds to the formula $CO(NH_2)_2+(C_6H_5OH)_2$.—Arch. d. Pharm., July 1886, 623–625.

Antipyrine—Detection.—Blumenbach recommends treating the aqueous infusions with petroleum benzin, and after the addition of ammonia with benzol, chloroform, or amylic alcohol, when very distinct reactions will be obtained with 0.01 or 0.005 gm., and faint reactions with 0.001 gm. of antipyrine in 100 ccm., of organic mixtures.

The alkaloidal reagents produce precipitates in not too diluted solutions of antipyrine, and ferric chloride gives in neutral solution 1 : 1000 a dark brown color, 1 : 10,000 a light-brown, and 1 : 50,000 a light yellow color. Fuming nitric acid colors dry antipyrine dark red, and in liquids green, recognizable in solutions 1 : 10,000. The solution mixed with concentrated sulphuric acid and warmed with a little fuming nitric acid, becomes deep red.

Observations with animals prove that antipyrine is rapidly resorbed and for the next 18 to 24 hours may be detected in the urine; but only for a few hours in the different organs. On the other hand, antipyrine was found after putrefaction of two weeks, in all organs of animals that had been killed about two hours after swallowing the chemical or receiving it by hypodermic injection.—Amer. Jour. Pharm., Dec. 1886, 596; from Pharm. Zeitsch. f. Russl., 1886.

Antipyrine—Value as a Styptic.—Messrs. Henocque and Huchard have used antipyrine for bleeding from the nose and on wounds on the hand and fingers. They applied 0.5 grams by dusting on the wounds.—Archiv der Pharmacie, Dec. 1886, 1027.

Antifebrin—A New Antipyretic.—Messrs. A. Cahn and P. Hepp draw attention to a new antipyretic, which has been named "antifebrin," and which is a well-known chemical compound:

Acetanilid or Phenylacetimide ($C_6H_5NHC_2H_3O$). It is a pure white, crystalline, odorless powder, with a slight burning sensation on the tongue, is almost insoluble in cold but more readily in hot water, abundantly soluble in alcohol and alcoholic fluids. It melts at 113° C., and boils unchanged at 292° C. It has neither acid nor basic properties, and is very resistent to most reagents. By experiments on dogs and rabbits the authors convinced themselves that even in relatively high doses it produces no poisonous effects. The temperature of normal animals is not affected by it.

The recommendations of this antipyretic are its efficiency in comparatively small doses, the absence of troublesome symptoms on the part of the stomach, the slight amount of transpiration, and lastly its cheapness. The dose is 0.25 to 1 gram in water or wine.—Amer. Jour. Pharm., Nov. 1886, 565–567; from Centralbl. f. Klin. Med., August 14, 1886.

Antifebrin (Acetanilid)—Reactions.—To test antifebrin for aniline, Mr. Yvon triturates a small quantity of antifebrin with water, and then adds hypobromite of sodium. If the antifebrin is pure the liquid remains clear and has a yellow cast; if aniline is present a red-orange colored precipitate is produced, the liquid becoming the same color. If antifebrin is heated with mercurous nitrate a green coloring matter soluble in alcohol is produced. This reaction can also be used for testing urine. The urine is shaken with chloroform, the chloroform evaporated and the residue heated with a small particle of mercurous nitrate. If antifebrin is present the green coloring matter is produced.—Ph. Zeitung, xxxii, p. 53.

Acetanilid—Preparation and Characters.—Yvon communicates the following respecting the preparation and characters of acetanilid or, as it is more commonly called, antifebrin: 372 grams of the purest aniline and 240 grams of glacial acetic acid are heated for 4 hours in a flask provided with a reversed condenser to boiling; the excess of both ingredients is then distilled off on a sand-bath, this being completed when the temperature reaches 260°. The cooled, congealed residue is crude acetanilid, which may be purified by sublimation, or better by repeated crystallization from water. The yield is about 400 grams. The author gives the melting point of acetanilid at 101°, while it is generally given at 113°. The sublimed preparation is whiter and lighter than that obtained by crystallization, which has the appearance of boric acid. Acetanilid should be odorless and colorless, even when melted, and should sublime completely. On treatment of a mixture of acetanilid and water with a solution of hypobromite of sodium, neither a precipitate nor orange color, indicative of the presence of aniline, should be formed. The mixture remains clear and light-yellow. When heated in a porcelain capsule and a little nitrate of mercury is added, acetanilid produces a green color. This reaction serves for its detection in urine, which is shaken out with chloroform, and the residue of evaporation of the chloroform treated with mercuric nitrate as described. The green body is soluble in alcohol.—Arch. d. Phar., March 1887, 274, from Jour. de Phar. et de Chim., 1887, xv, 20.

Thalline—Detection.—Blumenbach found that thalline is not, or only in traces, taken up, by agitating acidulated aqueous solutions with benzin, benzol, chloroform or ether, but is dissolved from ammoniacal liquids by these solvents, however only sparingly by petroleum benzin. Distinct reactions could be obtained by this treatment with 0.001 gm. of thalline in 100 ccm. of urine; from a similar amount of blood or food-mixture the reactions were faint, but with 0.005 gm. were distinct. The green color produced by ferric chloride is distinct in solutions 1 : 10,000, and still recognizable in dilutions 1 : 100,000. A green color is also produced by gold chloride, silver nitrate, chromic acid, chlorine water, and mercuric nitrate, and in acid solutions also by chlorinated lime and potassium ferrocyanide. Iodine colors dark brown, then dingy green; platinic chloride yellowish green; and a red color is produced by warm fuming nitric acid, by sulphuric and nitric acids, and by sugar and sulphuric acid. The solutions of thalline, if not too dilute, yield precipitates with the usual reagents for alkaloids.

Given to animals by the stomach or subcutaneously, thalline caused a dark coloration of the urine, which contained very little unaltered thalline, but after acidulation yielded to benzin, benzol, etc., a derivative colored green by ferric chloride; after precipitating the phosphoric acid with a few drops of ferric chloride, the filtrate yields with more ferric chloride the red color observed by Jaksch.—Amer. Jour. Pharm., Dec. 1886, 595; from Pharm. Zeitsch. f. Russl., 1886.

Thalline--Synthesis.—Dr. G. Vulpius has delivered a lecture before the German Apothecaries' Association in which he gives a very interesting description of the various steps necessary to the synthetic production of thallin, showing at the same time that the process is not more complicated than many of the chemical processes in current use. The author's lecture is communicated to Arch. d. Pharm., Sept. 1886, 777–785.

Aniline Colors—Detection.—Referring to his method of detecting fuchsin in wine (which see under "Materia Medica"), Prof. O. Curtman states that he has tried the method for the detection of a number of aniline colors, and that with individual restrictions and modifications it may be successfully applied. The method is based on the formation of the characteristically odorous "isonitril" when the coloring matter is heated with solution of potassa and chloroform, this substance being developed with greater or less readiness in the case of magenta red, pure hydrochlorate of rosaniline, methyl violet, aniline violet, gentian violet, aniline purple, aniline blue, aniline green, and vesuvine brown. In the case of acid fuchsin and methyl blue, it gave the reaction after the addition of sulphuric acid. Aniline brown has to stand some time after the heating, and gives the reaction better with alcoholic sodium hydrate, whilst in all other cases potassium hydrate has been found best. Aniline yellow and pure chrysaniline nitrate are the most resistent to the reaction, repeated boiling and addition of sulphuric acid being necessary. The author observes that the presence of sugar retards the reaction, and it is therefore preferable to extract the color from its association by alcohol, ether or chloroform.—Pharm. Rundschau, March 1887, 61–62.

Fuchsin—Solubility in Certain Volatile Oils.—This aniline-red was recommended by H. Zeisse as a test for the presence of alcohol in certain volatile oils. Mr. Jas. P. Mallon has now examined the behavior of aniline red to the volatile oils of bergamot, cajeput, caraway, cinnamon, citronella, cloves, coriander, cubeb, juniper, lavender, lemon, myrcia, neroli, pennyroyal, peppermint and sassafras, and found it to be soluble in all the oils named in sufficient quantity to communicate its color. The oil of peppermint had been recently distilled and was known to be pure; it was freed from water by treatment with calcium chloride and rectification, when it was not colored by aniline red, but in about twenty minutes this was seen to become soluble in the presence of 1 per cent. of alcohol; in the presence of 5 per cent. or more of alcohol the oil at once became pink and rapidly of a deeper color.

The effect of dehydration and rectification was not tried with the other oils mentioned above. It may be noted here that Zeisse found the oils of cubeb and sassafras, among several others, to be unaffected by fuchsin, and that these and other oils tested had been prepared by himself.—Amer. Jour. Pharm., Nov. 1886, 540.

Fuchsin—Determination—qualitatively and quantitatively—in *Wine*, which see under "Materia Medica."

Di- and Tetramethylparaphenylendiamine.—New and Sensitive Reagents for *Active Oxygen*, which see under "Inorganic Chemistry."

Congo-red—A New Color Reagent for Free Acid.—Dr. R. von Hosslin employs Congo-red, discovered by Böttiger, to determine free acid in preference to tropaeoline. Congo-paper assumes a handsome blue color in presence of free acids, but is not changed by acid salts.—Arch. d. Pharm., Dec. 1886, 1030.

GLUCOSIDES AND NEUTRAL PRINCIPLES.

Phlorizin—Chemical Formula.—Prof. E. H. Rennie has endeavored by a reëxamination of phlorizin to decide as to the correctness or otherwise of the usual formula, and also to ascertain whether the sugar yielded by it on hydrolysis is really dextrose or not. He shows by analyses and by a quantitative examination of the decomposition by dilute sulphuric acid, that the usually accepted formula and equation correctly describe the composition and hydrolysis of phlorizin. There can be little doubt that the sugar obtained is ordinary dextrose.—Pharm. Jour. and Trans., June 11, 1887, 1026.

Salicin—Solubility in Rectified Spirit.—Mr. D. B. Dott has determined the solubility of salicin to be one part in sixty-six parts of rectified spirit at 16° C.—Pharm. Jour. and Trans., May 21, 1887, 941.

Asparagin—Optically Distinct Varieties.—Mr. A. Piutti has observed a variety of asparagin which is distinct from ordinary asparagin. This latter is lævorotatory, and its crystals have left-handed hemihedral faces. He has obtained from the mother-liquor of crude asparagin an isomeride with right-handed crystals and dextrorotatory power, and of a much sweeter taste. The derivatives of the two varieties of asparagin are chemically identical, but differ optically, and the two aspartic acids combine in equal proportions to asparagenic acid, which is inactive and gives monoclinic crystals.—Compt. Rend, ciii., 134; Am. Jour. Phar., 1887, 263.

Digitalin—Inalterability by Digestive Agents, etc.—The experiments of Mr. Ph. Lafon show that digitalin is not altered by diastase, pepsin, gastric juice, pancreatic juice, bile, yeast, emulsin, or in contact with putrefying substances, and, therefore, cannot be altered in the digestive canal; but after it has entered the circulation it appears to be oxidized. Alkalies and mineral acids, with the exception of nitric acid, do not interfere with the detection of digitalin; but this is destroyed by nitric acid.—Archives de Pharm., 1887, 32.

Strophanthin—Preparation and Characters.—Mr. A. W. Gerrard, in view of the fact that no precise method for the preparation of strophanthin has been published, has worked out the following method: The alcoholic extract of strophanthus seed is dissolved in water, then filtered from the small amount of insoluble residue. Tannic acid in excess is added to the filtrate, the grey precipitate is collected, washed with water, and while still moist mixed with an excess of basic acetate of lead. The mixture is carefully dried and exhausted with warm alcohol; the filtrate is treated with sulphuretted hydrogen, the sulphide of lead removed by filtering again, and the alcoholic solution then evaporated to dryness. The scaly residue of strophanthin still retaining some coloring matter, is dissolved in warm water, digested with pure animal charcoal, filtered, and evaporated. Thus made, strophanthin is a pale yellowish amorphous substance, easily reduced to powder, but has some tendency to readhere. It is freely soluble in water and in alcohol, insoluble in pure ether and in pure chloroform; but if the latter liquids contain traces of alcohol, a small portion of strophanthin is dissolved. Strophanthin burns without leaving a residue. It has well-marked glucosidal characters. The author was unable to obtain it in crystals. $\frac{1}{50}$ grain given to a dog proved fatal.—Pharm. Jour. and Trans., May 14, 1887, 923.

Strophanthin—Delicate Reaction.—Mr. H. Helbing communicates the following reaction of strophanthin, whereby, he states, very minute traces of the glucoside may be detected: A trace of strophanthin is dissolved in a drop of water, and a trace of liq. ferr. perchlorid. is added, followed by a little concentrated sulphuric acid. A reddish-brown precipitate is formed, which, after a while, sometimes not before one or two hours, turns to an emerald-green or a little darker green body, which remains unchanged for a long time.—Pharm. Jour. and Trans., May 14, 1887, 924.

Cubebin—Alkaloid-like Reactions.—Prof. E. Schaer draws attention to several reactions of cubebin resembling those produced under the same conditions by veratrine, by aconitine, by morphine, and by digitalin. Like veratrine, it produces a deep red color with concentrated sulphuric acid, the purple-red color being, however, immediate, and changing easily to violet and cherry-red, retaining the latter for some time; whilst in the case of veratrine the colors pass from orange yellow to yellow red and blood red, and end with a tolerably permanent purple red. It is furthermore distinguished from veratrine in not producing the purple cherry-red color with concentrated hydrochloric acid. When cubebin is brought in contact with sulphuric acid to which 10–15 per cent. of water has been added, there is at first no color reaction; but after a time, longer or shorter according to the concentration of the acid, a handsome reddish color is produced, changing to a peach-blossom red sometimes, and at others to the darker tint shown by some digitalins. On the addition then of a little bromine or bromine solution, the characteristic blue-red color produced by digitalin under the same conditions is produced: a reaction which is designated as being distinctive of digitalin. The two may be distinguished, however, by the production in the case of digitalin of a blue green color in contact with phosphomolybdic acid and of a chlorophyll green color in contact with concentrated hydrochloric acid, neither of which reactions takes place with cubebin. If cubebin is allowed to remain in contact with syrupy orthophosphoric acid for some time, or, better, if it is mixed with the moderately diluted acid and then evaporated on a steam bath, in the latter case, as soon as a certain degree of concentration is reached, the mixture becomes at once of an intensely purple-red color. The same reaction takes place under the same conditions if sulphuric acid is substituted for phosphoric acid. Aconitine or aconite substances under the same treatment with phosphoric acid produce, it is true, a pale violet coloration. Nevertheless, viewed under certain conditions of light, the above named reaction of cubebin might possibly be mistaken for an aconite reaction. Similarly a well-known reaction of morphine might be confused with a cubebin reaction resulting under similar conditions. When pure conc. sulphuric acid is mixed with water in such quantity that in the cold it produces no color reaction or but a faint reddish color, the solution rapidly acquires an intense cherry-red color on the addition of a little sub-nitrate of bismuth, or solution of titanic or molybdic acid in sulphuric acid, the color changing in the case of the bismuth salt to chocolate brown. While this color reaction is not exactly identical with that produced under the same conditions by morphine, it may nevertheless lead to error under certain circumstances.—Arch. d. Pharm., June 1887, 531–539.

Piperine—Value in Intermittent Fever.—Attention is drawn in "Brit. Med. Journ." to the successful use of piperine in several cases of intermittent fever, which were not cured by quinine. It was given in doses of three to five grains, repeated every hour or every two hours.—Amer. Jour. Pharm., March 1887, 156.

Piperonal (Heliotropin)—Value as an Antiseptic and Antipyretic.—Piperonal or heliotropin has been hitherto used only in perfumery. It is called heliotropin, because found in the flowers of *Heliotropium peruvianum.* Piperonal is obtained by oxidation of piperic acid with potassium permanganate in alkaline solution. Fraggani recommends heliotropin as antiseptic and antipyretic. It is given in doses of 1.0 gram every 2 or 3 hours, or four times a day; even larger doses (2–3 grams) may be given at one dose.—Pharm. Centralhalle, xxviii, 253.

Phenylpiperidine—Preparation from Benzol.—Mr. Eugen Sellman finds that when bromo (or iodo) benzol is heated in a tube for several hours at 250–270°, a considerable portion is converted into phenylpiperidine and bromhydrate (or iodhydrate) of piperidine, the latter being deposited on cooling in form of large tabular crystals. By appropriate treatment of the liquid portion of the reaction, the phenylpiperidine, $C_5H_{10}NC_6H_5$, is finally obtained pure. It is a colorless liquid, heavier than water, has a faint fecal odor, and is strongly alkaline.—Arch. d. Pharm., May 1887, 451; from Ber. d. D. Chem. Ges., 1887, 680.

Santonin—Danger in its Administration.—Danger in santonin, even when given in moderate doses, was reported some weeks ago in the "Lyon Médical" to have been observed so frequently that the matter has been inquired into by the "Rép. de Pharm.," with the following results: The effects of white santonin were more toxic than that which had become yellow through exposure to sunlight, though the latter did not show any diminution in its therapeutic properties. Lawre thinks that the dose for a child of less than two years should not exceed 0.05 gm. In all cases it should be associated with a purgative—calomel, for example—to facilitate its elimination. "Santonin is innocuous or toxic," he says, "in proportion to the rapidity with which it may be eliminated, and this varies in individuals." Lewin and Caspari recommend that it be administered in oily solutions. In this form it is absorbed by the intestines slowly enough to permit a direct and prolonged contact with the worms."—Amer. Jour. Pharm., June 1887, 296.

Calcium Santonate—Preparation, Use, and Dose.—This salt is prepared, according to Heldt, by digesting calcium hydrate with santonin in alcoholic solution, until the red color has disappeared, evaporating the filtrate at a moderate temperature, exhausting the dry residue with water, and concentrating. The salt forms white satiny crystalline crusts, is permanent in the air and sunlight, has an alkaline taste and reaction, and is soluble in water and in alcohol. The compound has recently been recommended as possessing anthelmintic properties without being absorbed in the digestive tract. The dose is 1 grain.—Amer. Jour. Pharm., Nov. 1886, 534.

Isophotosantonic Acid—A New Derivative of Santonin.—Messrs. S. Cannizzaro and G. Fabriz have obtained a new acid derivative of santonin, which is formed, along with photosantonic acid, by the prolonged action of light on a solution of santonin in acetic acid. The new acid, isophotosantonic acid, is isomeric with photosantonic acid; it is sparingly soluble in water, tolerably soluble in ether, and readily in alcohol. At 100° it is converted into the anhydride. It is a monobasic acid, whereas photosantonic acid is bibasic. Besides these two acids, the authors note the formation of two acetyl derivatives of santonin.—Ber. d. D. Ch. Ges., 19, 2260.

Glycyrrhizate of Quinidine—Preparation.—Dr. Hager prepares this compound as follows: 1000 grams of coarsely powdered peeled liquorice root are macerated in 1.5 litres of distilled water at about 40° C. for 12 hours; it is then displaced with a mixture of 1.5 litres of distilled water, 70 cc. ammonia water (10 per cent.) and 15 grams of bicarbonate of ammonium, and lastly with distilled water until the liquid has a pale yellow color and scarcely perceptible sweet taste. The mixed liquids if turbid (owing to the presence of carbonate of calcium) must be filtered. To the filtrate is added by agitation a solution of 75 grams of sulphate of quinidine in 500 cc. lukewarm distilled water and 300 grams of hydrochloric acid sp. gr. 1.124. If after the lapse of one hour the solution should have a strong alkaline reaction, it must be neutralized with dilute acetic acid. It must be stirred frequently and then put aside for several hours. The precipitate is collected on a wetted linen strainer and washed with cold distilled water, gently expressed and spread on porcelain plates in layers about 1.5 cm. thick and only covering one-half of the plate. The plates are placed in a slanting position so that the liquid can drain off. When dry it is powdered in a cold porcelain mortar. The yield is about 200 grams. Thus prepared glycyrrhizate of quinidine is a gray-yellow powder, of a bitter-sweet taste, insoluble in water and sparingly soluble in alcohol. Acids and alkalies decompose it. Its composition corresponds to the formula $C_{20}H_{24}N_2O_2.C_{44}H_{63}NO_{18}+2H_2O=1577$. It contains 41.09 per cent. quinidine.—Ph. Zeitung, xxxi, 641.

Aloin—Characters as Obtained from Curaçoa Aloes.—Prof. W. Stoder has prepared aloin from Curaçoa aloes. The product is odorless, bitter, burns readily, giving off a caramel odor, and leaves no ash. It is tolerably soluble in water, readily in alcohol, and practically insoluble in ether and in chloroform. The aqueous solution, which is light yellow, readily reduces Fehling's solution. It is dissolved by sulphuric and by nitric acid with a red color. If to its solution in sulphuric acid some fuming nitric acid is added, an evanescent gray-blue color is produced, which has hitherto been regarded as characteristic for nataloin.—Arch. d. Phar., May 1887, 454; from Niew Tiedschr. Pharm., 1887, 98.

Cantharidin—Chemistry.—Mr. B. Homolka has studied the chemical character and relations of cantharidin. He finds that it is dissolved by prolonged heating with an alkaline solution, forming an alkali-salt of

Cantharidinic Acid, $C_{10}H_{12}O_6M_2$. This acid is formed, therefore, by the assimilation of 1 mol. H_2O. According to Dragendorff cantharidinic acid is again resolved into canthardin and water when its salts are decomposed by a mineral acid. But the author finds that this is not the fact in the case of dilute, cold solutions; there is no separation of cantharidin at all on addition of dilute acids, but that separation occurs when the solution is heated to 60°–70° C. Cantharidinic acid, therefore, appears to be capable of existing in aqueous solution under certain conditions, though the author has not succeeded to isolate it.

Alkaline Cantharidates are best obtained pure by decomposing the silver salt with the calculated quantity of the alkaline bromide. To prepare

Cantharidate of Silver, cantharidin is dissolved in excess of dilute solution of soda, the solution is neutralized exactly with nitric acid, and then precipitated with nitrate of silver. Its composition corresponds to the formula: $C_{10}H_{12}O_6Ag_2+H_2O$.

Cantharidin-dimethylic Ether, $C_{10}H_{12}O_5(CH_3)_2$, was obtained by the author by decomposition of the silver salt with iodide of methyl. It constitutes large, glistening, flat prisms, which melt at 91° C., are readily soluble in alcohol and in hot water, but sparingly dissolved by cold water. By treatment of cantharidin with hydroxylamin, the author obtained, under elimination of water, a

Cantharidoxim, having the formula $C_{10}H_{12}O_3(N.OH)$. It is easily soluble in ether and in alcohol, and crystallizes readily from water in splendid, stellately grouped needles.—Arch. d. Phar., July 1886, 629–630; from Ber. d. D. Chem. Ges., xix, 1082.

Vanillin—Occurrence in Asafoetida.—Mr. Ernst Schmidt having observed that the final mother-liquor from ferulic acid, obtained from asafœtida, had a decided odor of vanillin, caused some experiments to be made by Messrs. Paul Lemcke and Carl Denner, who succeeded in isolating from asafœtida some well formed crystals of vanillin, having in all particulars the characters and properties of vanillin obtained from other sources. It is, however, present in very small quantities only.—Arch. d. Pharm., 1886, 534–535.

Vanillin—Physiological Action.—Dr. Grasset has found vanillin fatal to frogs in doses of from three-quarters to nine-tenths of a grain, but has not ascertained that there is a toxic dose for the higher animals. In frogs it acts chiefly on the spinal cord, its action being that of strychnine, but much milder. It seems to delay putrefactive fermentation. It is antagonized by chloral. Therapeutically it may be used in doses of three-quarters of a grain, as an aid to digestion, especially in atonic and putrefactive dyspepsia, or as a corrigent of drugs which, like chloral, are not well borne by the stomach; also, in doses of from three to four grains, in mucilage, as an excito-motor.—Arch. d. Pharm., Aug. 1886.

Thiocoumarin—Production and Characters.—Mr. F. Tiemann has obtained thiocoumarin by the action of pentasulphide of phosphorus on coumarin. It crystallizes from its alcoholic solution in long, gold-yellow needles, having the composition C_9H_6SO, melts at 101°, is insoluble in water, easily soluble in alcohol, in ether, and in benzol, and may be sublimed without decomposition when heated above its melting point. It is reconverted into coumarin quite readily by simply heating the alcoholic solution a short time with solution of potassic hydrate. On addition of hydrochloric acid, pure coumarin is precipitated with evolution of HS. —Arch. d. Pharm., Sept. 1886, 805; from Ber. d. D. Chem. Ges., 19, 1661.

Inosite — Preparation from Walnut Leaves, and Characters.— Mr. Maquenne obtains inosite from walnut leaves as follows: the leaves are extracted methodically with about four times their weight of water, and the boiling solution is precipitated first with milk of lime, then with lead acetate, and finally with basic lead acetate, which forms an insoluble compound with the inosite. The last precipitate is washed with water, decomposed by hydrogen sulphide, and the solution concentrated to a syrup. The boiling liquid is then mixed with 7 or 8 per cent. of concentrated nitric acid, which destroys nearly all the foreign matter without attacking the inosite, and, after cooling, a mixture of 4–5 vols. of alcohol with 1 vol. of ether is gradually added to the nearly colorless liquid. Inosite is thus separated as a colorless flocculent precipitate, which is recrystallized from dilute acetic acid, dissolved in water, again treated with nitric acid, and again precipitated with alcohol and ether. A small quantity of calcium sulphate, which always occurs in the product, is decomposed by adding barium hydroxide, and the barium is removed by means of ammonium carbonate, the product being finally recrystallized from water. The yield is about 2.94 grains per kilo. of leaves.

Anhydrous inosite has the composition $C_6H_{12}O_6$, whilst the crystals have the composition $C_6H_{12}O_6 + 2H_2O$; they lose all their water at 110°. Inosite does not volatilize without decomposition, but its molecular weight can be determined by Raoult's cryoscopic method, that is, by determining the freezing point of its aqueous solution. The freezing point of a solution of 2.5 grams of inosite in 100 grams of water is —0.29°, whilst the calculated value for $C_6H_1O_6$ is —0.27°. It is only slightly soluble in cold, but very soluble in warm water. It is insoluble in alcohol, ether and glacial acetic acid, but dissolves readily in dilute acetic acid, from which it can be easily crystallized, It melts at 217° without carbonization, and boils with slight decomposition in vacuum at 319°. When heated in the air it burns readily. Solutions of inosite are optically inactive, both when freshly prepared and after they have been in contact with *Penicillium glaucum* for six weeks. Inosite is not attacked by boiling dilute acids or alkalies, does not reduce copper solutions, and is not acted on by ammoniacal silver nitrate alone, but in presence of sodium hydroxide it yields a mirror of metallic silver.— Comp.. Rend., 104, 225–227; Jour. Chem. Soc., April 1887.

Juglone—Synthesis.—Messrs. A. Berthensen and A. Semper have succeeded on preparing juglon—the characteristic constituent of *Juglans regia* (which see also) synthetically. Juglone, $C_{10}H_6O_3$, is oxynaphthochinone, $C_{10}H_5(O_2)OH$. To obtain it, dioxynaphthalin is oxidized in the cold with a mixture of bichromate of potassium and sulphuric acid. After standing 24 hours, the precipitate formed is filtered off in the cold, washed, and boiled with ether. The ether is distilled off, and the residue crystallized from chloroform. The juglone is thus obtained in handsome, brown-red needles, having the peculiar faint odor of walnut hulls, and being actively sternutatory, like the dust of the same. The authors have also prepared various derivatives of the synthetically prepared juglone, which correspond with those obtained from the natural principle.—Arch. d. Phar., June 1887; from Ber. d. D. Chem. Ges., 1887, 934.

Glycyphyllin—Preparation and Characters.—In continuation of a former communication (1881), Prof. E. H. Rennie describes the *glycyphyllin* obtained by him from *Smilax glycyphylla.* The ethereal extract of the alcoholic extract of the leaves was repeatedly crystallized from hot water containing a very small quantity of water, and the last traces of coloring matter were removed by quickly shaking up the warm aqueous solution, cooled down to beginning crystallization, with ether, and filtering the ethereal solution, or by precipitating the coloring matter from the hot aqueous solution by lead acetate, treating the filtrate with H_2S and again filtering. The principle has the composition $C_{21}H_{24}O_{29}$ and crystallizes from water with 4½ aq., and from aqueous ether with 3 aq. It is insoluble in chloroform, benzene and petroleum benzin, somewhat soluble in ether, freely soluble in hot water, and very sparingly soluble in cold water, but imparting to it its peculiar liquorice-like taste. The solution is precipitated by basic lead acetate, but not by the normal acetate. The solution in alkali becomes red-brown on exposure. On boiling with dilute sulphuric acid the principle is decomposed into *isodulcit* $C_6H_{14}O_6$ (melting point 93–94° C.), and *phloretin* $C_{15}H_{14}O_5$ (melting point 250° C.); the latter on being boiled with potassa, yielded phloroglucol $C_6H_6O_3$ (melting at 208°), and phloretic acid $C_9H_{10}O_3$ (melting at 127°). The theoretical yield, according to the above formulas, is phloretin 65.22 and isodulcite 43.33 per cent.; by experiment, 65.01 to 66.31 per cent. of the former and 42.2 per cent. of the latter were obtained.—Jour. Chem. Soc., Dec. 1886, p. 857.

Boldoglucin—Therapeutic Value and Dose.—Dr. René Juranville describes his experiments and experience with boldoglucin, the glucoside from *Boldoa fragrans* (see Proceedings 1885, 194). On account of its strong odor boldoglucin cannot readily be given in the form of mixtures; but it was best administered to insane patients enclosed in gelatin capsules or by means of clysters. In doses of 1.5 to 4.0 gm. it produced a decided hypnotic effect, and occasionally cessation of the hallucinations;

but these as well as sleepnessness returned on discontinuing the use of the remedy. Though it cannot supplant other reliable hypnotics, it appears to be useful in certain forms of insomnia.—Amer. Jour. Pharm., Feb. 1887, 77.

Asclepiadin—A Glucoside from Asclepias, Vincetoxicum, etc.—Mr. C. Gram has found *Asclepias currasavica*, *A. incarnata*, and *Vincetoxicum officinale* to contain a glucoside, *asclepiadin*, which is readily soluble in water, sparingly soluble in alcohol, and is easily converted into the less active asclepin. Harnack's asclepiadin, which appears to be identical with Feneulle's asclepin, was obtained from the herbaceous portion of *Ascl. currasavica.* The root of vincetoxicum yielded asclepiadin, but no asclepin. Of two commercial resinoids of *Ascl. tuberosa*, of American manufacture, the one consisted of asclepin with a small quantity of a substance having a tetanic action, while the other was a mixture of asclepiadin, asclepin and asclepion, the latter being a constituent of vincetoxicum and of milkweed.—Chem. Centralbl. 1886, 735.

Tyrotoxicon—Characters, etc.—This poisonous compound, which was first isolated from certain cheeses, milks and creams by Mr. V. C. Vaughan, has been further studied by him and by Mr. F. G. Novie. The explosiveness of the platinic chloride compound led to its comparison with similar azo-compounds, and it seems likely that the poison is diazobenzol butyrate or lactate. . From unwholesome oysters a body was obtained which likewise agreed with the tests for diazobenzol. The investigations are continued by the authors.—Med. News, April 2, 1887, 369.

Mallotoxin.—A presumably new constituent of *Kamala*, which see under "Materia Medica."

Wistarin.—A poisonous glucoside from *Wistaria chinensis*, Lin., which see under "Materia Medica."

Oxycoccin.—A new glucosidal bitter principle from *Vaccinum macrocarpon*, Lin., which see under "Materia Medica."

Inflatin.—A crystalline body from *Lobelia inflata*, L., which see under "Materia Medica."

Hydrangin.—A new glucoside from *Hydrangea arborescens*, which see under "Materia Medica."

Orthosiphonin.—A glucoside from *Orthosiphon stamineus*, Bentham, S., which see under "Materia Medica."

COLORING MATTERS.

Coloring Matters—Detection in Red Wines.—Mr. J. Herz communicates the following methods whereby the character of the coloring matter in red wines may be determined. To 30—50 cc. of the wine, or if the quantity of coloring matter in the wine is small, 100 cc. concentrated to 30 cc., 20—30 cc. of a saturated solution of magnesium sulphate, and

10—20 cc. of soda solution are added, stirring well; if necessary the treatment is repeated until the liquid is colorless, or nearly so. The filtrate is made acid with dilute sulphuric acid (1 : 3), and if sulphonic acid colors are present the red color reappears. The most commonly used member of this group, *acid-magenta* (rosanilinesulphonic acid), yields a violet-red solution, and can be estimated by comparing the tint with magenta solutions of known strength. One mgram. of magenta per litre can be distinctly detected in 30 cc. of wine without previous concentration. When *archil* (*orseille*) colors are present, the filtrate is bluish, and when made acid turns a litmus-red color. To test for magenta under such circumstances, Blarez's method of shaking with lead dioxide is used; this destroys the orseille and natural color. Cazeneuve's method is not recommended. To test for other colors in the magnesium hydroxide precipitate, the gelatinous mass is stirred up with hot water, allowed to settle and the liquid decanted off. If only the natural color of the wine is present, or *bilberry* has been used, this liquid is yellow-brown; if *archil* has been used, dark-violet; if *ponceau*, onion or ponceau red; if *cassissine*, pale-red or dark-yellow; if *vinicoline bordelaise*, a yellow-red to yellow-brown liquid, which when poured on sulphuric acid gives a violet ring. By shaking the colored liquid with amyl alcohol, *ponceau* yields an onion-red residue; *vinicoline*, a dark-brown one; *cassissine*, a dirty-green, violet at the edge, turned yellow by strong hydrochloric acid. The precipitate is a dark-gray or brownish-gray color when the natural or vegetable colors only are present; with *archil*, it is violet; with *magenta* (acid or ordinary), dirty white; with *cassissine*, dirty yellow-brown; with *vinicoline*, crimson-red. The precipitate is mixed with sand, dried, and extracted with ether; the extract contains any ordinary magenta which can be identified in the usual manner by dyeing wool, or *cassissine* which dyes wool red-brown and leaves a yellow-brown residue in the dish. The dyed wool becomes yellow when treated with strong hydrochloric acid, and colorless with ammonia. When wine is shaken with amyl alcohol, and the colored extract evaporated, the residue, if it contains the substances named, behaves in the manner described below:

		With concentrated		
		H_2SO_4.	HCl.	NaHO.
Archil	violet-red	blue	red	blue
Bordeaux, B	carmine	carmine	carmine	carmine
Ponceau, RRR	dark-red	crimson	crimson	brown
Cassissine	violet-purple	yellow	yellow-brown	red
Vinicoline Bordelaise .	cherry-red	brown	red	brown;

whilst the wine after extraction is cherry-red with ordinary *magenta*, violet-red with *acid-magenta*, dark-cherry with *Bordeaux*, yellow-red with *ponceau*. Wine colored with *magenta* produces a violet froth. The detection of vegetable coloring matters in presence of the natural color of wine or otherwise is a matter of great difficulty, and most of the known methods are ineffectual; it is, however, effected by the author with comparative facility in the following manner: 10 to 15 cc. of wine is shaken with 5 cc. of a saturated solution of tartar emetic, and then examined by reflected and transmitted light either at once or, if no immediate change has taken place, after some time. This treatment produces with genuine red wine always a cherry-red color, and with other substances as follows: *Red poppy* (*Papaver Rhœas*), dark cherry-red; *cherry*, violet; commercial *elder* coloring matter, red-violet; *bilberry* (*Vaccinium Myrtillus*), blue-violet; *privet-berry*. pure violet. White wines artificially colored, and red wines mixed with artificial colors, have been successfully examined in this manner; in the latter case the wine some time after treatment is compared with a genuine red wine to distinguish more readily the change of color. Old solutions of privet do not give the color change. Sodium hydrogen carbonate produces with pure *elderberry* grey-violet, and with *bilberry* brown-green. Tartar emetic appears to form an antimony lake with the coloring matters. With practice, all the above-mentioned colors can be detected in 30–50 cc. of wine. In the subsequent communication the author acknowledges the priority of Ambühl and Elsner's recommendation of the use of tartar emetic for the purpose in question. They, however, recommend hot solutions; the author finds cold better. Fermented bilberries give the violet color even better than unfermented berries, especially when fresh, inasmuch as oxidation interferes with the delicacy after a time. The distinctness of this color is increased by diluting the wine.—Jour. Chem. Soc., Jan. 1887, 91; Chem. Ztg., x, 968, 998.

Wine Colors — Composition of a New Preparation.—Mr. Portes has drawn attention, before the "Société de Pharmacie," to a new coloring material for wines, which is sold as "a colorant undiscoverable" by chemists. He found it to consist of a mixture of tropæoline, sulphate of fuchsine and indigo-carmine. He first treated the coloring substance with boiling amylic alcohol, which dissolved the tropæoline; the residuum, treated with alcohol, dissolved the fuchsine; and the final residuum treated with water, dissolved the indigo-carmine. Wines colored with the substance show, precisely like natural wines, a greenish reaction when treated with ammonia. This is explained by the fact that the reagent bleaches the fuchsine, leaving the blue and yellow matters, which mixing together give the green color. The coloring substance is not easy to detect in wine, the fuchsine alone being easily separated.—Archives de Phar., June 1887.

Orcin—Synthesis.—Messrs. H. Cornelius and H. v. Pechmann have succeeded in preparing orcin synthetically. The steps in the process are the conversion of aceton dicarbonic ether by the action of sodium into the sodium compound of dioxyphenylacetic dicarbonic ether, separation of the ether from the latter by treatment with sulphuric acid, treatment of this with baryta water or alcoholic solution of potassium hydrate to produce free dioxyphenylacetic acid, conversion of this into its silver salt, and dry distillation of the silver salt in a current of carbonic acid. Orcin distils over and is easily purified by extraction of the distillate with ether and crystallization.—Arch. d. Pharm., August 1886, 715–716; from Ber. d. D. Chem. Ges., xix, 1446.

Orcin—Characters and Uses.—Attention is directed in "Rundschau" (Prag, xii, 955) to the value of orcin as a dermatological remedy, possessing some advantages over resorcin or cocaine. In burns it eases pain quicker than either of them. Orcin is a dihydroxyltoluol, prepared synthetically by fusing hydroxylate of potassium with chlorocresyl-sulphonic acid. It is a white, stable powder, having a mild aromatic odor, a sweet, bitter taste, and dissolving readily in the ordinary solvents, crystallizing from aqueous solutions quite easily.

Orcin—Action of Aniline.—Messrs. A. Zega and K. Buch have studied the action of aniline upon orcin, and find that it is identical with that upon hydroquinon and upon resorcin. It loses one hydroxyl group after another, first forming oxamine and then diamine.—Arch. d. Pharm., Aug. 1886, 717; from Journ. prakt. Chem., 33, 538.

Morindin—Characters.—Morindin, discovered by Anderson in the roots of *Morinda citrifolia*, has hitherto been examined by Rochleder and Stenhouse, and by Stein, the latter obtaining results at variance with those of previous experimenters. Messrs. T. E. Thorpe and T. H. Green all have now experimented and obtained results that agree with those of Stein. They extracted morindin from roots obtained from the Director of the Royal Gardens, Kew, and have compared its properties with those of ruberythric acid, with which substance Rochleder and Stenhouse had found morindin to be identical. They find that the two substances are not identical, and that they behave very differently on hydrolysis. Morindin gives with sulphuric acid and ferric chloride, and on treatment with nitric acid, perfectly different reactions from alizarin, which has been stated by Rochleder and Stenhouse to be identical with the *morindon* formed under these conditions. The analytical numbers obtained for morindin agree closely with those of Anderson, who gave the formula $C_{28}H_{30}O_{15}$; those obtained for morindon indicate that it is probably trihydroxylmethylanthraquinone.—Pharm. Jour. and Trans., Dec. 11, 1886, 480.

Fisetin—A New Coloring Matter from the Wood of Rhus Cotinus.—Mr. Jacob Schmid has isolated the yellow coloring matter of the wood of *Rhus Cotinus* (the so-called fiset-wood). The commercial extract of the wood was boiled with alcohol containing a little acetic acid, the liquid treated with acetate of lead, filtered, the filtrate treated with H_2S, again filtered, evaporated to a smaller volume, mixed with twice its volume of boiling water, and allowed to stand. The coloring matter was deposited in yellow flocks, and purified by repeated solution in alcohol and reprecipitation with hot water. It is obtainable in the form of fine lemon-yellow crystalline needles by crystallization from diluted alcohol; or from acetic acid, in the form of deep yellow prismatic crystals containing 6 mol. of water, and having the formula $C_{23}H_{16}O_9 + 6H_2O$. It is nearly insoluble in cold water, very sparingly soluble in hot water, but readily in methyl alcohol, ethyl alcohol, aceton, or acetic ether. The author describes its chemical constitution, and the ether compounds into which it may be converted, such as hexa-acetylfisetin, hexa-benzoylfisetin, hexa-æthylfisetin, etc.—Arch. d. Pharm., Sept. 1886, 805; from Ber. d. D. Chem. Ges., xix, 1734.

ALBUMINOIDS.

Albumen—Comparison of Reactions.—Mr. Simon has subjected the different reactions for albumen, embracing: 1. Simple heating; 2. Heating the fluid with an equal volume of saturated solution of sulphate of sodium after addition of a drop of acetic acid; 3. Stratification with nitric acid; 4. Millon's reagent; 5. Roberts' reagent; 6. Erbach's reagent; and finally, 7. Mehu's reagent, the latter being composed of a mixture of 1 p. phenol, 1 p. acetic acid, and 2 p. water. The author declares the last-named reagent to be the most sensitive and reliable of all.—Arch. d. Pharm., March 1887, 273; from Jour. de Pharm. et de Chim., 1887, xv, 31.

Pepsins—Best Method for Preparation.—Mr. J. A. Grierson has examined the different commercial pepsins with results which point out the best method for the preparation of pepsin. The presence of epithelium in the best samples renders it evident that they are prepared in some way direct from the stomach without undergoing any previous solution and filtration. Whether these are prepared strictly according to the B. P. method (Beale's), or by some modification of it whereby the, in the author's experience, impracticable method of scraping is done away with, there is no evidence to show. Petit's process is inapplicable on a commercial scale, because the pepsin is treated throughout in neutral media, whereas it has been clearly shown that pepsin is much more soluble in acid liquids. Scheffer's process has the fault that the salt does not throw out all of the pepsin. Regarding liquid preparations, the author observes that wines are much inferior to glycerin preparation, but the author does not consider the want of activity of the wines to be due to the alcohol they contain, but rather to one or all of three causes: either the crude material has been deficient or faulty, or the hardening effect of alcohol on animal tissues has prevented the menstruum from exerting its solvent action, or there has not been sufficient acid in the menstruum.—Pharm. Jour. and Trans., Dec. 18, 1886, 496–498.

Pepsin—Proper Condition of Material for Extraction.—Mr. Podwissotzki calls attention to the fact that fresh mucous membranes show very little pepsin, but a large quantity of propepsin; consequently a much larger yield can be obtained from membranes which have been exposed to the air and prevented from decomposing. To extract the pepsin, diluted hydrochloric acid or glycerin acidulated with hydrochloric acid is recommended. Alcohol extracts a very small percentage, glycerin extracts the propepsin, which must be treated with hydrochloric acid at ordinary temperature for from 2 to 10 minutes to be converted into pepsin.—Rundschau, Leitme., 1886, 578.

Pepsin—Precaution in Testing.—Dr. Robert G. Eccles communicates a highly interesting paper entitled "How to test Pepsin.". He draws attention to the various causes that may affect the result unfavorably, and gives explicit directions for carrying out the different steps of the test. The paper cannot be profitably abstracted without going into greater detail than is admissible here, and reference must therefore be had to the original paper in West. Drugg., March 1887, 69–71.

Pepsin—Method of Assay.—Mr. Frank S. Hereth communicates a paper on the method of assaying the commercial pepsins, in which he draws attention to the defects of the officinal directions and proposes some improvements, which while perfectly clear as to some of the manipulations are not so clear as to others. Reference may be had to the author's paper in Amer. Drugg., Aug. 1886, 143–144.

Pepsin—Action on Calomel.—According to Mr. Torsellini, the solubility of calomel is materially increased in the presence of pepsin, though only in acid media; for instance, in such containing 0.2 per cent. of hydrochloric, lactic, or phosphoric acid. Corrosive sublimate is not formed. While acids by themselves also further the solubility of calomel, their action is greatly accelerated by the presence of pepsin.—Arch. d. Pharm., Nov. 1886, 936; from Ann. Chim. Farm., Aug. 1886, 105.

Pepsin with Bismuth—Compatibility of Mixtures.—With a view of testing the asserted incompatibility of pepsin and bismuth salts, Mr. Harry K. Kroh made a number of experiments regarding the digestive action of pepsin in the presence of bismuth salts. The ammonio-citrate of bismuth is unsuited for preparing clear solutions with pepsin. Bismuth subnitrate was found to somewhat retard, but not otherwise interfere with, the digestion of albumen in the presence of hydrochloric acid, added in the usual proportions. Mixtures of 1 pepsin, 10 bismuth subnitrate, 50 hard-boiled albumen, 500 water and 8 hydrochloric acid, left only 3 parts of the albumen undissolved at the time when, in the control experiment without bismuth salt, the albumen had been completely dissolved. The best method of administering the two remedies is in the form of mixtures, using the subnitrate of bismuth and directing the mixture to be shaken.—Amer. Jour. Pharm., Nov. 1886, 539.

Peptones—Isolation and Properties.—According to Messrs. W. Kühne and R. H. Crittenden, ammonium sulphate precipitates from a solution all proteïds but peptones. Peptones can in this way be obtained free from albumoses, with which they have in previous researches always been mixed. It was therefore necessary to repeat many previous experiments concerning the composition and properties of peptones.

Amphopeptone, the mixture of peptones obtained in gastric digestion, and *antipeptone*, from tryptic digestion, were thus examined. The result of digestion was acidified with acetic acid, saturated with ammonium sulphate, filtered, the filtrate evaporated to small bulk, and filtered from the crystals of the salt which separated; the remainder of the salt was removed by aqueous baryta, and the last traces by barium carbonate; dilute sulphuric acid was added to remove the baryta, and the barium sulphate filtered off. From the filtrate the peptones were precipitated by alcohol, redissolved, and again precipitated by phosphotungstic acid, and dried. In the case of amphopeptone, the first analyses were invalidated by adherent pepsin, and a substance designated mucin-peptone, apparently derived from the mucous membrane of the stomach; it forms a sticky, elastic precipitate with alcohol, but was not further investigated. The error due to these admixtures was obviated by saturating concentrated artificial gastric juice with ammonium sulphate; this precipitates the mucin and pepsin; pepsin alone redissolves in dilute hydrochloric acid; this solution was used as a digestive fluid; from it no mucin-peptone was obtained. The remains of the pepsin were subsequently removed by the ammonium sulphate with the albumoses.

Antipeptone was prepared both from fibrin and by the pancreas being allowed to digest itself.

The following table gives some of the results obtained in the analyses of these substances. In each case the samples had been purified by means of phosphotungstic acid. I. Amphopeptone from fibrin; II. Antipeptone from fibrin; III. Antipeptone from the pancreas:

	C.	H.	N.	S.	O.	Ash.
I.	48.75	7.21	16.26	0.77	27.01	3.22
II.	46.59	6.69	18.28	0.67	27.77	3.67
III.	44.47	7.15	17.94	0.57	29.87	2.07

Contrasted with previous analyses, the numbers obtained show about 1 per cent. less carbon, 1 per cent. more nitrogen, and 0.3 to 0.4 per cent. less sulphur. The percentage of nitrogen is greater in antipeptone, especially in that obtained from the gland, than in amphopeptone.

The following are the chief properties of pure peptone: When dissolved in water, it hisses and froths in the same way that phosphoric anhydride does; heat is at the same time evolved. Its solution in water is brown, which prevents its lævorotary power from being estimated. Its taste is somewhat cheesy, but not unpleasant. The bitter taste of artificially digested food must therefore be due to some product not yet separated, native proteïds and albumoses being almost tasteless. Peptones are not precipitated by sodium chloride in acid solutions, nor by ammonium sulphate; they are completely precipitated by tannin, potassio-mercuric iodide, phosphomolybdic acid, phosphotungstic acid, and picric acid.—Amer. Jour. Phar., Nov. 1886, 568–571; from Zeitsch. Biol., xxii, 423.

Peptones—Detection in the Blood and Urine.—Mr. Georges observes that all the methods hitherto proposed for the detection of peptones in urine are more or less defective. He gives preference to the following method: Precipitate by heat all the coagulable albumin; treat the urine with acetic acid and the double iodide, wash the precipitate on a filter with cold water charged with acetic acid to the same extent as the urine; wash again with the same acidified water boiling, keeping the washings apart. The clear liquid obtained gives a precipitate on cooling if the least trace of peptonic precipitate has been dissolved. It is only necessary to neutralize in order to obtain a solution to which the double iodide test can be applied. For the detection of peptones in the blood, the author employs the method recently recommended by Wassermann. The blood is received in strong alcohol; the clot thrown on a filter is washed first with cold then with boiling water; the aqueous solution is concentrated to about double the volume of the blood taken, and then added to the alcoholic solution; sodium acetate and ferric chloride are now added to the liquid. After filtration and cooling, the last traces of albumin are removed by adding potassium ferrocyanide and acetic acid, filtered, the excess of ferrocyanide precipitated by copper acetate; filtered, excess of copper removed by hydrogen sulphide; filtered again, and heated on the water-bath to expel hydrogen sulphide and to concentrate the liquid. This method gives good results, especially if care be taken to neutralize, or even to add any slight excess of alkali on adding the sodi-acetate and ferric chloride. It also serves very well for the investigation of peptones in urine, commencing by boiling to precipitate albumin coagulable by heat, and terminating as above.—Jour. Pharm. Chim., 1886; Jour. Chem. Soc., Feb. 1887, 188.

Diastase—Preparation and Characters.—Mr. C. J. Lintner recommends the preparation of pure diastase by digesting undried or air-dried malt with alcohol of 20 per cent., and precipitating the decanted solution with absolute alcohol. The pale yellow flocculent precipitate is repeatedly treated with absolute alcohol, then with ether, and afterwards dried *in vacuo* over sulphuric acid. The light, yellowish white powder so obtained is dissolved in water, precipitated by alcohol, macerated in alcohol, washed with ether, and dried as before. In this condition it still retains about 10 per cent. of ash, mainly phosphate of calcium, which may be reduced one-half by dialysis. Deducting the inorganic constituents, the composition of diastase so obtained was found to be C46.66, H7.35, N10.41, S1.12, O34.46. It does not reduce Fehling's solution. Its solution, on being evaporated, acquires a brown color, and, on boiling, separates floccules, which are soluble in caustic soda. The albumin reaction is obtained with Millen's reagent, and an intensely, but transient, blue color with Schönbein's test.—Jour. f. prakt. Chem., xxxiv, 378.

Milk-Juice Ferment—Characters, etc.—Mr. A. Hansen has examined the latex of different species of plants for the presence of ferments. He finds none in the Euphorbiaceæ, in *Ficus elastica*, *Scorzonera*, *Taraxacum*, or the juice of the opium poppy. The latex of *Ficus Carica*, on the other hand, contains principles capable of effecting four fermentative changes; they peptonize albuminoids in the presence of either alkalies or acids, act like diastase on starch, and coagulate the casein of milk. 20—100 grams of fibrin previously caused to swell by immersion in hydrochloric acid of 0.2 per cent. strength, are completely dissolved in 10—30 minutes when treated at 40° with 2—3 cc. of this latex. The products of this digestion are the same as with pepsin, yet the two ferments are not identical, since the ficus latex peptonizes in presence of alkalies as well as acids, although more slowly. Probably there are two peptic ferments present, one acting in acid, the other in alkaline solutions.

By digestion with hydrochloric acid, the latex entirely loses its peptonizing properties; digestion with sodium carbonate (which destroys the activity of pepsin) retains them intact. If a few drops of the latex be added to milk, which is then raised to the boiling temperature, the casein is at once precipitated. Incipient ebullition, therefore, does not destroy the curdling power of this latex, although prolonged ebullition does, and even a temperature of 65° if continued for two hours. The diastatic action of this latex is demonstrated by the partial transformation of starch-paste and glycogen into sugar. When the latex is precipitated by alcohol and the precipitate taken up with water, the action on milk and on starch is found to persist, whilst that on fibrin disappears.

The latex of *Carica Papaya* peptonizes, precipitates casein, and transforms starch into sugar.

The author does not consider that these vegetable ferments play any *rôle* in the nutrition of the plant.—Jour. Chem. Soc., 1886, p. 1059; Botan. Ztg., 1886, p. 137.

Papayotin—Use in the Preparation of Peptones.—Mr. Ferdinand Lascar, while experimenting with some pure papayotin, which he had received from Jamaica, found that a peptone of superior quality, and which kept sweet for twenty-four hours, can be prepared by employing ¼ grain pure papayotin dissolved in about 1 fluidounce of water, to 6 ounces of lean beef. The meat should be cut in small pieces, and the mixture kept for about two and one-half hours at about 130° F. No addition of chemicals is required, and the product when strained through a thin muslin rag, adding, if necessary, a small quantity of boiled water, is ready for use.

If desired, an addition of 5 per cent. of brandy previously diluted may be added. This same peptone may be employed as an embrocation, when an absorption by the skin of nutritious substance is wanted; the locality where it is applied should, however, previously be washed with a weak solution of soda. In preparing this peptone with papayotin, which can be done by almost any sick nurse, it seems that this vegetable ferment has retained some of the antiseptic properties of the papaw plant, which, in the West Indies, often is used in curing meat. Ordinary prepared peptone has generally a more or less bitterish taste, which additions of salt or spices often are unable to cover, while the papayotin peptone is pleasant, and retains the aroma of the beef, and for this reason it is admirably better suited than the former to be given per os.

To make milk peptone, it requires one centigram of papayotin to 250 grams of sweet milk, and a temperature of about 130° F. for one hour. Peptonated milk can also, alternately with beef peptone, be employed for rectal alimentation.

Milk—Test Based on the Percentage of Albuminoids.—Mr. Lajoux finds that while, as is well known, all other constituents of normal cow's milk vary considerably, the albuminoids present never fall below 30 per cent. in the normal milk of healthy cows. He utilizes this observation to the determination of pure unwatered milk. The fat, salts and sugar having been determined, the sum is deducted from the total solids found, which gives the total of albuminoids.—Arch. d. Pharm., Nov. 1886, 939; from Jour. de Pharm. et de Chim., 1886, xiv, 216.

Casein—Use as an Emulsifier.—Mr. Leger proposes casein as an emulsifier on account of its permanence and the ease with which it may be handled. To separate it, he treats 4 litres of milk with 60 gm. ammonia for 24 hours, and, after removing the saponaceous matter from the surface of the mixture, precipitates the serum with acetic acid. The magma of casein, strongly pressed, is treated with sodium bicarbonate, with a sufficient quantity of sugar to make the dried product contain one-tenth of its weight of casein. The powdered substance dissolves easily in water, and, mixed with its weight of gum, may be used for almost all of the emulsions. Resinous matters and balsams previously dissolved in alcohol, essences and oils, may be mixed with it in the bottle itself without using the mortar. The only defect in this saccharate of casein is its slight animal odor, which, it is believed, can be counteracted.—L'Union Pharm., May 15, 1887.

REPORT

OF THE

COMMITTEE ON THE DRUG MARKET,

FOR THE YEAR 1886–1887.

BY ALFRED H. MASON, MONTREAL.

As Chairman of a Committee left entirely to my own resources to compile a report upon the drug market, and located in Canada, where the English market is probably more a factor in the drug trade than the American, I am compelled to present such statistics and information as can be obtained from trade publications, with the assistance of advices from business connections, rather than from personal experience, which would be obtained by one in daily attendance upon the New York drug market, there will therefore probably be discrepancies for which we must claim your indulgence.

It has been felt by some members and suggested in previous reports, that the Annual Report of the drug market, which is distributed some months after the summary has been read, is of little value, and such was my first impression, but a little further consideration convinces me that the compilations of past years; besides having historic value, are well worthy of study, to enable one to conjecture as to the probable results of an advance or decline, if we take into consideration also the causes which bring about these changes. True it is that to be of immediate service to buyers, the sooner the information is distributed the better.

The condition of the money market—the fluctuations in exchange—the sudden demand for an article when supplies are short—the combinations amongst producers—the opportunities to corner stock when it is within the bounds to bring about such a result—the superabundant supplies which cause values to decline and render prices unremunerative to producers, often leading to a falling off of supplies from the primary sources, contribute to the bringing about of market changes.

As the standard of pharmaceutical education is being raised each year by the establishment of colleges, and the ultimate distributers of drugs to the public are becoming better capable to judge the nature and quality of the drugs supplied, the demand for genuine and selected drugs becomes greater and greater. New remedies being constantly introduced and active principles of drugs being isolated and employed rather than the crude drug in medicine, removes the pharmacist more and more from direct contact with the drug market; therefore such a report is perhaps of more interest to the wholesale buyers, as they also hear of the requirements of large quantities of certain drugs for use in the arts; but we must not overlook the fact that one of the secrets in our business lies in the art of buying at the right moment, and in the best market, and from primary sources if possible.

The general condition of the market during the past twelve months has on the whole been steady, with a general absence of speculative demand. Only a few articles have attracted special attention, the tendency of the majority of values on the whole however being upward, and firmer, but not strong. Buyers and manufacturers are always hoping that the bottom price has been touched, nevertheless the desirability of realizing as soon as possible frequently presents itself, as more advantageous than otherwise.

The volume of business has been quite up to the average, distribution being kept active owing to jobbers' purchases assuming more of a retail nature, orders being more frequent, and supplies distributed in smaller quantities. Whether this is advantageous to the buyers or not, they are the better judges.

Cinchonas, opium and their salts, seem to stand to the front all the time. Other staples with the exception of Eastern produce seem to sink into comparative insignificance. There are however a few exceptions where a rise and fall is particularly marked. We have tabulated some of the leading drugs and chemicals where changes have been more frequent and remarkable, and you will notice that the tendency is rather in favor of advance than otherwise.

The internal tax on alcohol used by druggists in the manufacture of preparations continues—the agitation hitherto employed not having been successful to effect its removal. It appears, however, that a favorable opportunity for this occurs at the present time, it only being necessary to show the members of Congress that public sentiment is sufficiently united in demanding it. It is therefore imperative that every pharmacist should use his utmost influence to bring pressure to bear upon Congress to remove the tax.

The alarming increase of fires during the past year (whilst fortunately the drug trade does not participate to the same extent as others), is my apology for calling attention to the Wholesale Druggists' Mutual Fire Insurance Company, which was successfully organized by the National Wholesale Druggists' Association, at their annual meeting in Boston, and I take the opportunity further to call attention to the importance of keeping fully insured. I do not know how the matter stands with you, but in Canada it is a serious consideration in trading, and if every wholesale dealer insisted upon having assurance that his customers are thus protected, it would be advantageous to all concerned.

The question of Commercial Union is one which is agitating the minds of thinking men in both countries. How the drug trade will be affected by such Union may be a subject worth investigating.

Owing to delay in obtaining from the Bureau of Statistics in Washington the import of drugs, fiscal year 1886–7, New York, this information will have to follow; and as it will contain certain facts of interest to be embodied with this report, we ask to be permitted to add it for publication.

The committee take pleasure in acknowledging their indebtedness for valuable information furnished by: The Oil, Paint and Drug Reporter.

John McKesson, Jr.
W. H. Raser.
St. John Bros.
Rosengarten & Sons.
H. J. Baker & Bro.
Thurston & Bradich.
James B. Horner.
etc., etc.

REPORT OF MR. C. F. G. MEYER, ST. LOUIS.

In the Western States a general prosperity seems to prevail, which is also shared by the pharmacist.

Prices of all kinds of chemicals and crude drugs have been exceedingly low during the past few years, and only isolated articles are high in this market. Here and at many other cities, prices are being cut on Patent Medicines by the retail dealers, so that profits are very small, and the dealer is compelled to resort to all sorts of business not legitimately belonging to him to make an honest living.

Respectfully submitted,
ALFRED HY. MASON,
Chairman of Committee.

The following articles have been affected by market changes during the past twelve months:

HIGHER.

Alcohol, aloes barb, aloes curacoa, ambergris.

Balsams—(Canada Fir, Copaiva, Peru, Tolu).—Bismuth, borax, bromides, caffeine, camphor, carbolic acid, cassia, castile soap, castor, citric acid, cloves, cocoa butter, cocaine mur., codeine, colocynth, cubebs, cuttlefish bone, ergot Russian.

Flowers—(Arnica, Chamomile).—Glycerin, grains Paradise, guarana.

Gums—(Arabic, Shellac, Tragacanth, Dragon's Blood, Kino, Sandrac, Senegal, Gamboge).—Hops, insect powder, iodine and its preparations.

Leaves—(Buchu, Coca, Damiana, Senna Alex. and Tv.).—Licorice paste, lycopodium, mace, manna, myrbane, mercurials, morphine, musk, nutmegs.

Oils—(Almond, Anise, Bergamots, Cajeput, Caraway, Cassia, Cod Liver, Cubeb, Lavender, Lemon, Neroli, Olive, Orange, Peppermint, Pennyroyal, Rose, Rosemary, Sassafras, Sesame, Wintergreen, Wormwood).—Opium, pepper (black, red and white), pilocarpine, pimento, potass. iodid., quassia, quicksilver.

Roots—(Arnica, Belladonna, Dandelion, Ginger, Golden Seal, Ipecac, Jalap, Serpentaria, Spigelia).—Salicin.

Seeds—(Anise, Canary, Cardamom, Caraway, Celery, Colchicum, Coriander, Cumin, Fennel, Hemp, Mustard, Rape).—Spermaceti, Tapioca, Venice Turpentine, Tonca Beans, Vanilla, Verdigris.

DOWN.

Alcohol, ammonia carbonate.

Balsams—(Copaiva, Oregon, Peru, Tolu).—Borax, Camphor, cantharides, carbolic acid, cassia, citric acid, cloves, codeine, cubebs, cuttlefish bone, chamomile flowers, glycerin, guarana.

Gums—(Kino, Shellac).—Hops, insect powder, iodine, juniper berries.

Leaves—(Buchu, Senna, Uva ursi).—Manna, myrbane, morphine.

Oils—(Almond, anise, bergamot, cassia, citronella, cod liver (Newfoundland), croton, cubeb, lemon, nutmegs, orange, peppermint, pennyroyal, sassafras, thyme, verbena).—Opium, pepper (red), pimento, potass. iodid., quinine.

Roots—(Gentian, ginseng, ipecac, jalap, rhubarb, sarsaparilla).

Seeds—(Anise, Cardamom, Hemp).—Sugar milk, sulphur, tonca beans.

Balsams.—Amongst the articles handled by the Drug trade which have advanced in price are balsam copaiva, fir, Tolu and Peru. In each case the cause of the change in values may be traced to a common source, shortage of supplies.

Balsam Copaiva.—At time of your last report stocks of balsam copaiva were large and had accumulated; prices however, unsupported by a sufficiently large demand, dropped until the unprecedently low figures which were ruling at the beginning of August, viz., 27 to 28 cents, were reached. From June to August the shippers in South America, where most of the balsam comes from, had an opportunity to discover that the prices obtainable in this market were extremely unprofitable. The crop was neglected and the receipts here fell off until they represented but a small percentage of the quantity usually received—the average monthly imports from January to June 1886 being 12360 lbs. After the imports began to fall off, the demand from the Continent began actively, and continued until the bulk of our stock was exported to Europe. Then a reaction set in and prices steadily advanced until April 1887, when they reached 42 to 43 cents, gradually receding to the present value of 35 to 36 cents; cause of the advance being that the gathering of the balsam at the primary sources had been neglected on account of the previous low prices.

Balsam Fir, Canada.—Owing to the low prices paid to the inhabitants in the Province of Quebec, where this balsam is collected, they neglected the gatherings in the season of 1886, and as a consequence supplies were short. The article, however, remained steady in our market at from $2.50 to $2.75 per gallon until February, 1887, when supplies became short, and although the demand was limited the article advanced up to $3.25 per gallon in July. The 1887 crop was collected much earlier than usual, and it was anticipated that the supplies would have been abundant. These expectations, however, have not been realized, but on the contrary the collections, if anything, will be below those of the previous season. Stocks in America being exhausted, shipments were freely made from Canada, and the price receded to $2.60 per gallon, which has been the bottom price reached. At the present time it is computed that all that remains in Canada of this year's collection is about 20 barrels; and as this is held in strong hands, it is probable that should the usual regular demand continue, very much higher prices will be reached before July next. This article seems to have some property, "sui generis," which Oregon balsam does not possess. It therefore holds its own in the market.

Balsam Fir, Oregon.—The demand for this has been without perceptible increase throughout the past year. In August the price was $1.75, but it fell month by month until $1.25 was reached, which is the present value.

Balsam Peru.—The imports of Balsam Peru seem to have fallen off for the same reason as that which affected Copaiva. Prices opened in August at $1.20, and remained tolerably firm until February, when it fell to $1.17½, and is now quoted at $1.12½. It has, however, during this period been considerably below its normal value, and it was anticipated that a steady upward movement would follow the advance in August, rather than a decline. It has always been an erratic article, advancing suddenly and declining with equal suddenness, and it is difficult to foreshadow its course for any length of time. The average monthly imports from January to June 1886, were 581 lbs., but from June to December, were only 356 lbs.

Balsam Tolu opened in August at 30 cts., when a good demand set in: the principal buyers being the manufacturers of chewing gum. Gum Chicle has been the principal competitor of Tolu for this purpose, but it advanced considerably in price owing to scarcity, and became dearer than Tolu. The result of the increased demand coupled with decreased stocks forced the market up, and it remained between 35 and 40 cts. up to January—the scarcity referred to being due to the fact that the prices obtainable in our market have not paid the shippers to send it to us, consequently the receipts were light. The article closed in January at 31 to 32 cts., but there is a prospect of an early advance, as stocks are reported as being small, and well concentrated. Receipts for the first five months in 1886 were 3,812 lbs., and after that only 1,265 lbs.

Berries, Cubeb, X. X.—Advices in March last from Java respecting the crop of cubeb berries were to the effect that a smaller yield than that of last year was anticipated, when only about 200 bags found their way to Holland, and as these reports to a great extent have been confirmed, it means that a much higher range of prices will rule during the coming season. The supplies available for the ordinary needs of consumption have been reduced to very small limits, the stock, in February last, according to reliable estimates, not exceeding 4000 lbs., or less than enough to meet the requirements of the market for one month. Stock in foreign markets is also very low, and at one time it was thought probable that at the rate of consumption the supply would be all but exhausted before the arrival of the new crop. It might not be out of place to call attention to a highly objectionable result of the enhanced value of cubebs, as it leads to the appearance of various species of cubebs (spurious). Although it has been announced by our customs authorities that all cubebs are subjected to close examination, the fact must not be overlooked that berries which are frequently purchased in London for the alleged purpose of exportation to America are in reality shipped to this country. The nature of the adulterations belongs to another report, but it may be consistent for us to call attention to the frequency with which fruit stalks occur amongst the berries, owing to imperfect garbling of the drug before shipment, so that a pharmacist should always insist upon receiving X.X. Stemless Berries, and purchasing only powder ground from these. The fact that powdered cubeb is often quoted at a price considerably below the price of X.X. Stemless tells its own story. The values of cubeb berries from August to November, 1886, were 80 to 85 cents, in December, 1886, 90 cents to $1.00, from January to May, 1887, $1.10 to $1.25, in May, 1887, $1.05 to 95 cents, June and July 80 to 90 cents, and are now ruling at $1.15 to $1.25, with the result that the stock of the world is concentrated in the hands of a New York dealer, with the exception of a very few small parcels. In this connection the values of cubeb oil will be of interest. From August to November, 1886, prices ranged from $7.25 to $7.50, November and December $7.50 to $8.00, January to March $9.00 to $10.00, April to July $8.75 to $7.50, now $9.00 to $10.00

Juniper Berries opened at 2½ to 3 cents in November, advancing to 3½ to 4 cents, at which they remained until April, when they fell to 3 cents, the valué at the present time being 3¼ to 3¾ cents, with probability of lower prices.

Camphor.—It seems impossible to obtain statistics as to the output of camphor in the United States. All that is known is that in a general way the output this year has been much larger than usual. The importation of crude camphor for the year ending June 30th, 1887, was 2,857,222 lbs. The price of refined in August 1886, was 22¾, and it varied a little between 22¼ to 22¾ until 1st of April, when it became very firm, advancing half a cent per pound. This advance continued further until June, when the demand for refined exceeded the output of the manufacturers, and purchases had to be made second-hand, as high as 27 cents being realized. It however assumed its old position before the end of the month, and has gradually declined to 22½ cents, which is the present value. It is well known that one of the chief uses of this aromatic gum, if not really the probable cause of consumption, is in connection with the packing of winter clothing, like blankets, etc., for the summer months. Nothing has been found so far to supersede it for this purpose, and its consumption has grown with each succeeding season.

Cantharides, Chinese—Prices were quoted in August at $1.50, reaching their highest at the end of October, gradually receding to 75 cents, which is the present value, and lower than they have been for the past four years.

Cantharides, Russian—Prices were $2.00 in August, declined each month until $1.60 was reached, which is the present value. The collection of this year's crop commenced in June, and recent advices speak of a shortage, and it looks as if higher prices will again prevail, as reports of a speculative movement on the Continent already are arriving. The importation of cantharides for the year ending June 30th, 1887, was 31,604 lbs.

Cuttlefish Bone.—About 12 cents per pound was the average price of this article up to February last, when the market responded to continued reports of advances in Trieste, sales being made as high as 18 cents. The movement was of a speculative character, and has been maintained to some considerable extent, prices receding to 15 cents in July, but now quoted 16 to 18 cents, with news of the new catch at Trieste.

Ergot.—Ample supplies of Spanish ergot prevented the high prices which it was expected would rule when it was announced that the 1886 crop of Russian was a failure. There has not been much deviation in the market quotations, 40 cents being the price in August, followed by 30 cents in December, advancing again to 35 in January, reaching 40 in March, present value being 30 cents, market firm; the imports for the year ending June 30, 1887, being 141,000 lbs.

Flowers, Arnica.—Quoted in August at 7 cents, advanced to 9 cents in January, when the new crop arrived on the market, and remained steady at this price until March, gradually receding until the present time, when they are quoted at 6½ to 7½.

Flowers, Chamomile, German.—The yield in 1886 proved to be abundant. Good flowers ranged from 18 to 22 cents in August, but were lowered when the new crop arrived, the average price being from 14 to 16 cents during the past year. The demand has been sufficient to prevent stocks accumulating. Reports as to the crop this season are not reassuring as to the quantity or quality of the yield. The dry weather, it is said, has caused a serious falling off, so whilst 1886 flowers are now quoted 14 cents, 1887 are quoted from 22 to 26 cents. It, however, often happens that the first gatherings of the Belgium crop are picked flowers, larger and whiter than the second gatherings, and commanding fancy prices.

Flowers, Chamomile, Roman.—Quoted 10 to 14 cents in August 1886, ranging between 10 and 11 cents until April 1887, when they sold at 15 cents. Reports however of short supplies abroad and probable advance later on have led to the supposition that higher quotations if not fancy prices will be realized for this season's supplies.

Gum Aloes, Cape.—The remarkably low range of prices which has characterized this article since 1885 for all varieties is still maintained, and their value has remained steady from 6 to 6½ cents, during the whole year.

Gum Aloes, Curaçoa, has followed the same course at a decreased value of half a cent. per lb., prices ruling at 5½ to 6 cents. It is thought that this species of aloes deserves a wider amount of attention than has hitherto been given to it. The recent analysis by Professor Otto Worth, of Pittsburg, of an ordinary sample gives the following result:

Extractive matter (aloin)	76.78
Resin	18.94
Albumen	2.14
Organic salts of potass	2.12

which if correct shows it to be closely allied to socotrine aloes.

Gum Arabic.—Has continued in moderate demand at firm prices during the whole year with a gradual advancing tendency and depreciation in quality of the grades. It was stated in January last that no further supplies could possibly come into the market until the end of the present year, but there are still later advices that this may be extended for at least a period of six months. Transactions for the past few months have been more or less of a retail character, but considerable quantities have nevertheless changed hands in this way. The scarcity has of course led to the introduction of various artificial substitutes without much success, but the difficulty of obtaining ordinary Arabic at reasonable prices has caused larger quantities of Sengal and White Senari to be used, and considerably enhanced the value of these species. Opening at 80 cents in August, 95 was reached in November, and is the present value for first Trieste sorts, opening at 43 cents, advancing to 58 cents, 60 cents being the present value. The quantity of Gum Arabic imported into the United States for the year ending June 30th, 1887, was 467,782 lbs. It is reported, however, that considerable quantities of this have been exported again into England.

Gum Asafœtida.—With heavy stocks in speculators' hands, and only a steady demand to work this down, prices remain at from 8½ to 9 cents firm.

Gum Opium.—The position of this article is at present of more interest than it has been for the past four years, and all doubts seem now to be set at rest as to how large a supply we are to have, the results of the gathering of the crop being now determined. Whilst the reports of a shortage which have been confirmed, for some time led to an advance in the Smyrna and London markets, our market has not as yet followed to the same extent.

	Cases.
The actual stock in London, June 30th, 1887	1839
" " Turkey, "	2760
" " America, "	1250
	5849
Probable crop of 1887	1800
	7649

Leaves the world's stock 7649 cases.

As it sometimes happens that one bad crop follows another, in all probability the market will pass through a critical period next spring, and if this is so, extreme prices will be paid next year. In June 1873, the world's stock of Turkey opium was 4000 cases, and a prospective crop from 3000 to 4000 cases (actually 2880 cases), price advanced from $4.90 per lb. to $6.90 in bond. In June 1875, when the crop was 7000 cases, the range of prices in bond was from $4.00 to $6.75. The estimates of 1876 were 4,000 to 4.500 cases (actually it turned out 3,280), and with the world's stock of about 4,000 cases prices advanced from $3.75 to $5.62 in bond. In 1880, with from 2,500 to 3,200 (actually about 2,400 cases), the world's stock was 4,000 cases, prices advanced from $3.87 to $6.75 per lb. in bond. The estimate for 1887 varies from 2.500 to 3,000 cases (actually 1,800), the world's stock 7,649 cases (liberally estimated), and the price in June $2.25 per lb. in bond, which was fully 62½ cents per lb. under the cost to import from Turkey, and 37½ cents per lb. under the ruling rate in London. As soon as they were satisfied that the reports of a shortage were truthful, Symrna merchants purchased in our markets at $3 75 per lb. in bond. The importations for June were only 42 cases against an average of 242 cases per month for the past six months.

The following statement of the comparative prices in Smyrna and New York, with price of morphia at the same time, will be interesting:

		Smyrna.	New York.	Morphia.
1873, March 7	170 p.	(equals about $4.50 in bond cost)	$4.75 in bond	$5.00 pr oz.
1873, May 20	200 p.	" 5.40 "	5.50 "	5.25 "
1873, June 30	215 p.	" 5.80 "	6.25 "	5.75 "
1873, July 30	215 p.	" 5.80 "	6.25 "	6.00 "
1876, June 24	150 p.	" 4.05 "	5.25 "	4.25 "
1876, July 13	160 p.	" 4.32 "	6.00 "	4.60 "
1876, July 31	170 p.	" 4.59 "	6.25 "	4.60 "
1876, Aug. 3	175 p.	" 4.72 "	6.30 "	4.60 "
1876, Aug. 12	180 p.	" 4.86 "	6.35 "	4.60 "
1880, Jan. 16	145 p.	" 3.91 "	3.75 "	4.00 "
1880, Jan. 29	155 p.	" 4.18 "	3.90 "	4.10 "
1880, Feb. 3	160 p.	" 4.32 "	4.12½ "	4.10 "
1880, Feb. 27	162 p.	" 4.37 "	4.25 "	4.10 "
1880, March 16	170 p.	" 4.60 "	4.50 "	4.15 "
1880, April 3	177 p.	" 4.79 "	4.75 "	4.75 "
1880, April 23	195 p.	" 5.26 "	5.25 "	5.00 "
1880, May 28	190 p.	" 5.13 "	5.25 "	4.50 "
1880, June 16	200 p.	" 5.40 "	5.50 "	5.00 "

The crop of Persian opium has also proved a small one. This, however, does not influence the price of Turkish, as it is prepared expressly for the morphia manufacturers, excepting so far as the consumption of morphia exceeds the quantities produced from the Persian crop.

The following is the total crop of Turkish opium from 1870 to 1887:

	Cases.	Lowest Price.	Highest Price.
1870	2700	$5.25	$9.40
1871	8500	4.90	6.00
1872	4500	6.10	7.90
1873	3000	5.95	7.90
1874	2300	5.00	9.00
1875	7000	5.00	7.75
1876	4000	4.75	6.60
1877	9500	4.75	6.70
1878	5500	4.25	4.70
1879	4000	4.35	5.25
1880	2000	4.87½	7.75
1881	10000	3.90	6.25
1882	5500	3.87½	4.50
1883	6500	3.50	4.10½
1884	5000	3.50	4.10
1885	7000	3.30	3.90
1886	7500	2.80	3.25
1887	1800 to August.	3.25	4.60

The following is the actual production of opium in 1887, with sources from which contributed:

Smyrna, Marmara, Akhissar	20 cases
Kircajatz, Balukesser	200 "
Alachéir, Mékiol, Couls, Esmé, Démirdji	15 "
Ouchac, Simav, Ghédis	70 "
Aidin, Nazli, Denizli	15 "
Tzal, Paclan, Ichikli, Taskir	10 "
Sparta, Bouldour, Karagatz	50 "
Carahissar, Sandicli, Polavat, Azizié	250 "
Aksheir, Ilchin	100 "
Yalavatz	30 "
Penchseir, Seidichier, Poukir, Koniad	100 "
Keutakia, Eski Cheir, Gheve, Tavchaulé	150 "
Angora, Beybasar and environs	20 "
Malatia, Zilch, Tokay	200 "
Salonique	100 "
	1830 cases.

Gum Tragacanth.—The same causes which affect the prices of Gum Arabic, to a considerable extent affect this article. Alleppe became firmer in November last, and in February reached 45 cents for firsts. Turkish also advanced in December to 85 cents per pound, and the probabilities are that much higher prices will rule; not of so much interest to pharmacists, the demand being chiefly for manufacturers.

Insect Powder.—Owing to the continuous heat and dry season, insect life has had full opportunities for development, and the demand for this article has been greater than was ever known previously. With 28 cents as the bottom price for best Dalmatian Powder, stocks became so much reduced, and demands so great, that 45 cents was quoted in February last, and it remained until some excitement was exhibited and the market boomed at 50 cents, the price now named. The stock of Californian powder at the primary source is reported to have been distributed, further orders cannot be accepted, and as it is further reported that stocks of this year's flowers in Trieste have been cornered, we may expect fancy prices next season unless some holders prove too weak to hold.

Arrivals at Trieste during season 1887	490 tons
Deliveries from Trieste	580 "
Stock in Trieste June 30th, 1887	35 "
Arrivals in New York to June 30th, 1887	298.496 tons.

Leaves, Buchu.—One of the most remarkable attempts at cornering which have occurred during the year was with round short buchu leaves, varying at from 8 to 10 cents per lb. until February, when the article was quoted 35 cents, and kept up to 24 cents during the three months following. An eminent firm of manufacturing pharmacists thought of cornering fluid extract of buchu, and with this object cabled to the Cape to know the exact stocks at the primary markets. Having satisfied themselves as to the reliability of their information, they bought up the supplies there and all they could get on the New York market, removed it to their works, and report says actually had it ground. The home market was demoralized for a time, and fancy prices ruled, but London did not follow to the same extent. The natives at the primary sources, stimulated by the demand which cleared out stocks, set to work to get together fresh supplies and soon sent forward large quantities, so that in May the article assumed its normal value, and good green leaves are now quoted 7 to 8 cents per lb.

Leaves, Senna Alex. have ruled at an average price of 30 cents per lb. throughout the year, varying from 28 to 32; supplies have been small everywhere. The most business was done in February. The stock of natural in this market being concentrated by the sale of 2500 lbs. at 32½ cents, and about 7500 lbs. at 30 cents per lb., making in all about 9000 lbs., the market being firm at 32½ cents for natural, 42½ to 45 for garbled and sifted, and 30 to 32 for siftings.

Leaves, Senna Tinnevelly.—There has been great scarcity throughout the year, and quality was inferior. It was reported in August that remaining stocks here were not sufficient to last sixty days, and the current quotation was 12 to 22 cents. New crop came forward in September, and in February prices were again advanced to 12 to 25 cents, with reports that no further supplies of better grades were to be had. The market is still hardening, but without notable change, as new supplies are expected shortly.

Lycopodium is an article of considerable importance in the market, the principal consumption being in pyrotechny, but recently it has been employed in considerable quantity by moulders. The value in August was 30 cents per pound, but it advanced in October to 43 cents, falling in June to 37 cents. Supplies come from Russia, and the present value is 38 to 40 cents.

Mace has experienced a serious advance. Price in August 43 cents, advanced owing to scarcity to 52 cents in March, and Batavia is now worth 70 cents.

Oil Anise.—This article, quoted $1.55 in August, soon experienced an advance, which steadily continued until $1.95 was reached in June, owing to short crop, reduction in stock, and concentration of supply, the stock in May being controlled by two importers, whose holdings represented the entire stock of the world. As stocks in Hong Kong were exhausted, purchases were made on our market for Chinese account. The reports of prospects of coming crops are complicating, the consumption appears to be increasing, and there is every probability that much lower prices will not be attainable for some time. Present quotation, $1.85 to $1.90.

Oil Bergamot.—Quotations in August for best were $2.60; this, however, gradually declined until $2.00 was reached in January, continuing stationary until June, when a further decline to $1.80 took place. Reports as to the damage to the crop by drought in July caused a sharp advance to $2.35; this report being confirmed, the article is now firm at $2.62½ per lb.

Oil Cod Liver.—Newfoundland oil has remained steady at from 60 to 75 cents per gallon, but at such prices it is unremunerative to the collectors. Stocks are heavy, and adulteration with seal oil not uncommon. It is reported that the fisheries this year have been a complete failure, in which case it is doubtful whether any medicinal oil will be made unless remunerative prices are offered beforehand.

Norwegian best non-freezable has ruled from $26 to $28 per barrel. The fishing in Norway begins in January or February at Lofoden and extends into April—the early catch producing oil of finer quality, as later the fish go North. Owing to continuous storms the fishing this year was delayed, and it was reported that the catch was a comparative failure. The Lofoden fishing up to February 12th had only yielded 4,730 barrels of oil, against 15,708 in 1886 and 19,360 in 1885. Higher prices were asked, but good stocks of old oil remaining in London and Hamburg, the larger buyers deferred laying in stocks until the result of the Finmark fishery was known. The quality obtained there is not so fine as that made at Lofoden. The yield, however, turned out better than was expected, and above the average, 4000 barrels being secured against 2100 in 1886. Prices are higher, present quotations being $27 to $29 per barrel, but unless there is an increased demand this season, and Newfoundland not produced, it is not anticipated that we shall see much higher prices.

Oil Cubebs.—See Cubeb Berries.

Oil Peppermint.—The crop last year was somewhat larger than that in 1885, and quotations for 1886 oil opened at $3.00 to $3.15 per lb., but it was discovered that large quantities of dementholized oil were being sold as genuine or used for mixing with Western oil. The arrest of a man in Detroit, at the instigation of the State, put a stop to the fraud, and we trust that his punishment will prove a warning to others who have been following his example. The quantity of this oil disposed of has been estimated at about 10,000 lbs.; this naturally helped to weaken the market, in addition to the endeavors of bear operators to pull down prices by stating that the 1886 crop would be the largest ever known, and a rapid decline set in, which resulted in $2.75 being the quotation in July.

The report that this year's crop will be heavy, it is stated is not reliable, the reason given that the crop in the West has suffered severely from the drought, and that in Wayne county will not be more than last year; but between the lines of the statements made by the "bulls" and "bears," indications point to a good crop nevertheless. The present stock of 1886 oil at the primary sources is the smallest known at the corresponding period for ten years. Pure oil is now quoted $2.25; "Druggists'" brand, $3.15; H. G. Hotchkiss, $3.00 to $3.10. The competition from Japanese oil is being felt, but it is thought that the bitter and crude taste of that which has been offered as yet renders it unsuitable for use in confectionery. The quantity of oil of peppermint exported this season has been 81,666 lbs., and stocks in Europe are reported light.

Oil Sassafras.—The article which is the best and commands the highest price has a sp. gr. 1070—lower grades of lighter gravities are 2 or 3 cents per lb. less in value; this stronger oil is more economical for use by soap-makers and perfumers. The lighter gravities however are suitable for liniments. Worth 35 cents per lb. in August 1886, it advanced 1 cent in September and remained inactive until January 1887, when an upward movement set in. Owing to stocks being low on the spot, and an effort being made to corner the market, prices went up to 43 cents, which was maintained during February, when a reaction set in and the article gradually receded until the present low price, 35 cents per lb., was reached. There are however indications of a speculative movement and higher prices may soon be expected.

Oil Wintergreen, owing to active demand which prevented the accumulation of stock, was marked up to $2.00 in August 1886, with small stocks on the spot and very little coming forward, prices advanced to $2.15. In January 1887, however, supplies were reported as coming in freely, an easier tone prevailed and $4.90 was quoted; little interest being manifested later the article gradually declined until May, when $1.70 was reached. With the approach of warm weather, however, it advanced again, and $1.95 is the present price. The export demand for this article is to some extent checked by the use of the artificial product in Europe. Is all that is sold here true oil of wintergreen?

Root Ipecac.—Quoted 87½ cents in August, declined to 30 cents in November, and this price ruled until January, 1887, when a sharp advance took place with indications of much higher prices, which were fully realized to such an extent that in May $2.25 was reached. As this article is of steady and uniform outlet, the movement was at first felt to be purely speculative and unwarranted by the actual position of the article, but it was afterwards found that the prevalence of cholera throughout the producing regions in South America caused a vigorous quarantine to be raised against persons and goods from those districts. The stock in Europe being practically exhausted, orders from England came to our market, spot stock being concentrated and insufficient for home consumption, that advance was also warranted from the statistical position of the drug. In May, however, the quarantine in Brazil was raised, and with arrivals in London the market began to decline. In July $1.75 per lb. was asked for spot stock, and $1.25 to arrive. The imports to June 30, 1887, were 23,633 lbs.

Root Jalap.—Quoted 12 cents in August, declined 1 cent in September, but was marked up to 12 cents again in December. In January, 1887, an unusually large demand set in, and 15 cents was obtained. With the arrival of new crop in May the article declined to 12 cents, present value being 11 cents. The imports to New York to June 30th, 1887, were 69,300 lbs., which show a considerable falling off in supplies.

Root Sarsaparilla, Honduras, quoted 28 cents in August, prices have been tending gradually downward throughout the year, and 24 cents is now the value. New York maintained its position as the principal market in the world for this article. The sales during 1886 were 2240 bales, the greater bulk being for export.

Root Senega, quoted 42 cents in August; has gradually declined all the year, until 34 cents was touched, which is the present price. The sources from which supplies come cover such an extent of territory that it is almost impossible to arrive at any accurate estimate as to the quantities collected. Minnesota has become the chief centre of distribution. Large quantities of Manitoba root are being gathered. What becomes of it seems to be a mystery, as it is not so suitable for pharmaceutical use as the Western root, being coarse and chumpy, and containing a larger percentage of starch. The principal consumption of this article is in Europe.

Root Serpentaria.—Stock being controlled by speculative dealers in Texas, who tried to control the article, 40 cents per lb. was the price in August; but, foreseeing an inevitable decline, the holders gave way, and the article has gradually declined to 25 cents, its present value.

Seeds Cardamom.—The cultivated seeds the Ceylon planters are producing and sending forward liberally, are of such fine quality as to make us independent of the other sources of supplies from Malabar and Aleppo, which we had to rely upon previously. Quoted 90 cents per lb. in August 1886, they have remained steady throughout the year, with the exception of a drop to 85 cents which occurred in October, continuing until January, 1887, when 90 cents was again reached, which is the present value.

CHEMICALS.

Acid Carbolic.—The price of this article from August until December, 1886, varied from 20 to 23 cents per pound. Early in January, 1887, however, the price began to advance, and in February reached 50 cents per pound. Various reasons are assigned for these large appreciations in values. Some of these did not make their appearance until after the market began to advance. The probable cause of the advance in the price of crystals is due to the depreciation of the value of the by-product liquid carbolic acid, or, as it is technically known, the "uncrystallizable phenols." This by-product, commonly called No. 5 carbolic acid, is used for disinfecting purposes, and during the cholera scares in Europe and the East, particularly Japan, there was a large demand for it. Last year some European buyers of this No. 5 fell into the hands of unscrupulous persons, who supplied them with a worthless article in the place of the original carbolic acid, and therefore led to a want of confidence in the true article; therefore the demand fell cff, and the manufacturers of crystal had to make up their loss of profits by increasing the selling price. There is still another reason which contributed to the advance—the increased consumption of the acid in the production of melanite (new explosive), with which the German government was experimenting. Picric acid is used largely in this explosive, and as it takes 2 lbs. carbolic acid to produce 1 lb. picric acid, the consumption of the first for this purpose will probably reach a very large proportion. It was found that this new explosive would not keep, it rapidly decomposed, and as a consequence carbolic acid gradually receded in value, until it fell to 30 cents in July. Since this time, however, it has been reported that the difficulties in keeping the new explosive have been overcome, and the article at the present moment is firm, and likely to be dearer.

Acid, Citric.—With only one domestic manufacturer, the demands of the country cannot be met without foreign assistance. It is reported that a new factory will soon be started in New York, meanwhile the protective tariff of 10 cents per pound does not prevent importation, 69,404 lbs. having been imported to June 30 this year. Being an article of speculative interest, prices fluctuate more frequently. Worth 65 cents in August 1886, it fell to 58 cents in November, gaining again in January, when 61 cents was the price; but it went as low as 48½ cents in June. It has since, however, recovered itself, and 52 cents is the present price.

Acid, Tartaric.—As a uniform schedule of prices is maintained by the combined manufacturers of this article, which has been 44 cents per pound for crystals and 45 cents for powder throughout the year, there is nothing of special interest to say on this article. The domestic supply being equal to the demand, the protective duty of 10 cents per pound effectively shuts out all foreign competition.

Alcohol.—The price of this article has been higher than last year; the highest price was reached in October, when $2.18 was paid. This continued up to April, when there was a break, and the value is now $2.04 per gallon.

Borax.—Quoted in December, 1886, 4¾ cents per pound for concentrated, 5¾ cents per pound for "city refined," and about an eighth of a cent less for Californian refined, met with a decided improvement in January, 1887, when 6½ was named for city refined, which is its present value. In 1883, concentrated borax was selling at 12¾ cents per pound, a gradual decline to 4¾ in 1886 seems to be a shrinkage in value almost incredible that any industry could have survived. Over-production and excessive competition brought about the decline, but in one sense the great fall in the market prices has been a good thing for the manufacturers; it became so cheap that new channels of consumption were opened, and to all appearances, the outlet thus secured is a permanent one. The article is firm at the present advance, and if the demand continues, improvement may go on until the returns from its sale will make the production once more a profitable business.

Chloroform.—As this article is now produced in the States as cheap, if not cheaper, than any other country in the world, it is of interest to get some details respecting the output. The litigation at present in process respecting the validity of patent rights, caused the competing manufacturers, in the face of the increased values of materials employed, to sell at supposed unremunerative prices—they state that they cannot give the quantities of their output. It is, however, stated that that produced by the so-called "Acetone process" will soon amount to 6000 lbs. per week, and at the present time they are making 2000 lbs. per week. The output of that manufactured under the "Michaelis" patent, or by what is known as the "Ketone process," cannot be estimated accurately enough for publication. In the meantime, however, the proprietors of this patent contend that all the chloroform manufactured in the United States is made by their process. If this is so, some of our giants in pharmacy must get prodigious profits by exchange of labels. The price of this article is now only 38 cents per pound, but should the court decide the case in favor of the applicants, much higher prices may be expected.

Glycerin.—The production of crude glycerin in this country has averaged during the last twelve years about 3,000,000 pounds per annum, but this far from meets the requirements, and during the period the importation of crude has increased enormously, although there is a duty of 2 cents per pound on it. Little refined glycerin is imported, the duty on this being 5 cents per pound, so that the glycerin factories of the United States may be correctly termed refineries. The magnitude of this industry and its progressive growth is most impressively shown in the following table, giving the quantity imported in successive years from 1874 to 1887 inclusive:

Year.	Pounds of Glycerin Imported.	Wholesale Price.
1874	576,674	
1875	983,785	
1876	1,764,938	16 to 18 cents.
1877	1,438,400	18 to 21 "
1878	1,921,000	21 to 18 "
1879	2,180,000	15 to 18 "
1880	2,740,000	18 to 26 "
1881	4,937,881	28 to 39 "
1882	2,900,000	39 to 26 "
1883	3,604,000	38 to 36 "
1884	5,736,904	24 to 16 "
1885	7,806,080	16 to 15½"
1886	10,851,000	15 to 24 "
1887	12,765,072	14 to 26 "

In face of the largely increased importation, prices are still increasing, though our market for refined during the year has not followed the advance in Europe to so great an extent; with 14 cents advance in August, in October it advanced to 17, owing to the steady upward movement in the foreign market and reported concentration of stocks here. The advance continued with an upward movement until January, 1887 when 26 cents was reached. It fell to 22 in February, and has ruled 21 to 22 cents since, which is the present value. There are indications, however, of higher prices in the autumn. The consumption by the drug trade is small compared with the enormous quantities used in the arts and in the manufacture of dynamite.

Iodine Resublimed.—Quoted $3.25 in August, $2.35 September and October, fell to $2.60 in December—a combination then took place (see potass. iodid.), and a sharp advance to $4.00 per lb. followed in January, at which price it remains steady.

Morphia Sulphate.—This article, influenced by the opium market, ruled at the following prices for domestic manufacture during the year, including the one-eighth oz. vials.

1886.

July 30.	Nov. 30.	Dec. 13.	Jan. 28.	Jan. 31.	Feb. 10.	Feb. 14.	Mar. 23.	July 1
2.25	2.40	2.50	2.60	2.75	2.90	3.00	3.25	3.50 oz

Potass. Bromid.—The value in August was 35 cents per lb. in bulk, it fell in September to 34 cents, November 33 cents; but was advanced in February 1887 to 38 cents, at which price it remains firm. The resolution adopted by the National Bromine Association to extend the pool for six years from June 1st, 1887, would indicate that probabilities of a decline are remote.

Pot. Iodide.—Was quoted $2.60 in August 1886, $2.50 September, $2.30 October, $2.10 December. At the commencement of the present year the price of iodine, which had for some time been very low, and was expected to experience a further decline in consequence of the anticipated collapse of the combination of producers, suddenly rose to 9 d. per oz. The convention of the producers of iodine had been renewed, but the parties interested in it wisely kept their own counsel, and were enabled to reap a substantial benefit as the reward of their discretion. The new convention, to which most, if not all, of the manufacturers and the principal holders of stock in Europe, the United States, and the west coast of South America have acceded, was registered on February 18th at Iquique—the principal port of shipment in the iodine district now held by the Chilians. The agreement has been concluded for a term of 3 years commencing on January 1st, 1887, and it has been resolved that during this period the sale of the entire produce will be vested in one house exclusively. The European manufacturers are to have for their share 42½ per cent. of the total sales effected, so long as the latter do not exceed 336,000 lbs. If the sales of iodine exceed that quantity, which means about ten months' consumption, and is, therefore, probably to be taken as an annual limit, ninety per cent. of the excess will fall to the share of the Chilian producers.

The parties interested in the convention, in addition to the English and French producers, are divided into three categories, viz:

Firms possessing iodine manufactories in working order and holding stock in Europe.

New manufacturers, carrying no stock in Europe.

Owners of iodine holding stock in Europe, who are not at the same time manufacturers of the article in South America.

The parties falling under the first category will be compelled, under the terms of the agreement, to suspend the manufacture of iodine until their surplus stocks have been cleared off by their share of monthly allotments of sales effected. It is said that some firms hold enough stock in Europe to require two years and a half or three years before, under this system, they will be allowed to resume working, and if the estimate of the European stock owned by the Chilian owners is correct, this clause will apparently be tantamount to a virtual cessation of iodine production in the old Chilian works during the term of the convention.

The new producers of iodine, forming the second class of contracting parties, have their output strictly limited to the quantity assigned to them as their monthly share of the orders. Firms who hold stock in Europe, but who do not possess works in South America, have to submit to a fixed reduction on the amount of their monthly share of the sales, in order to recoup the producers for the compulsory limitation or temporary cessation of their output. The producing capacity of all works included in the convention will be estimated, and the share of such contracting party in the orders is to be fixed according to the relation between the producing capacity of his works, and the estimated annual consumption. To commence on January 1, 1887, the price of iodine for metallurgical and dyeing purposes is fixed at 6 d. per oz., and for all other, including pharmaceutical uses, at 9 d. per oz.

The aggregate capacity of production of sublimed iodine of not less than 98 per cent. standard in the South American works at the end of last year was estimated at 25,560 quintals, or 2,594,340 lbs; the European stock of Chilian iodine at 10,177 quintals, or 1,032,965 lbs; the export of iodine from the South American west coast in 1886 at 3,825.88 quintals, or 388,327 lbs.; and the world's consumption at 4000 quintals, or 406,000 lbs. These figures will prove that Chili is at present capable of producing six and a half times as much iodine as is required for all purposes to which the article is applied, and it must not be forgotten that there is at present no prospect of any considerable extension in the use of the article, even though the price should fall to a third or fourth of that prevailing. The stock of Chilian iodine now held in Europe would alone suffice for two and a half years' consumption, and the Convention must therefore necessarily restrict the output of iodine in South America to a very small fraction indeed of the present producing capacity. The directors of the Iodine Association propose, it is said, to gradually raise the price considerably beyond their present quotation, and, as they control the market at this moment, they will probably succeed. But the combination is likely sooner or later to come to grief through the impatience of its own members to submit to an artificial stunting of their producing powers, nor could the collapse of an association based upon principles so essentially vicious, from an economical point of view, be regretted, however disadvantageous it might be to its own component parts.

The result of this combination was an advance of $2.75 per pound, which took place in January, 1887, and owing to the difficulties of getting supplies from the manufacturers, a further advance to $2.85 took place in April. In May, however, a weak spot in the combination having shown itself, by another manufacturer springing up, the parties thereto dropped the price of iodine 1d. per oz., and iodide fell to $2.60. They were not, however, long in settling the dispute, for in July iodine was again raised to the former price, and pot. iodide to $2.75, the quotation of to-day.

Quicksilver.—Quoted 52 cents in August, 1886; advanced to 56 in September, owing to large demands from China—vermillion being wanted in large quantities to prepare for the celebrations in connection with the nuptials of the Ruler of the Celestial Empire. Prices being controlled to a considerable extent by the Rothschilds in London, the article is subject to such fluctuations as they may see fit: from 56 cents in September, it fell 1 cent per pound each month until 50 cents was touched, which is the present value. Indications point to higher prices.

Importations in 1887, 800,000 lbs.

Quinine Sulphate.—The attention which is being given to this article in the market is greater than its importance would seem to justify. The continued drop has discouraged all confidence, and it seems as though there was a disposition to endeavor to hammer the very bottom out of the article before any resuscitation can take place—with a rapidly increasing demand, although such competitors as antipyrin, antifebrin, &c., are also of large consumption. The domestic article has met with the following alterations in price:

1886.	1887.				
June 7.	Jan. 24.	Mar. 5.	Mar. 19.	April 15.	July 18.
65	70	65	62	58	55

As the manufacturers will not give any information necessary to get at the output of domestic quinine, any figures given would be purely speculative; it is safe to conjecture, however, that at least one-half of the quinine in the U. S. is of foreign manufacture. The quantity imported into New York for the year ending June 30th, 1887, was 1949.533 ozs., an increase of 775.33 ozs. over last year.

Salicin.—This article has fluctuated considerably during the year. From $1.50 per lb. in August it advanced to $1.95, at which it remained firm until December, when $1.70 was the price. In January, 1887, reports came that the stocks in London were almost exhausted, supplies were nowhere obtainable, and $10.00 per lb. was quoted here—whether actual sales were made at this figure is not reported, but in February $7.50 was quoted $3.00 per lb. is about the present value.

Imports, Fiscal Year 1886 to 1887. New York.

Acid, Carbolic	128,641	Pounds.
" "	851	Packages*.
" Citric.	102,494	Pounds*.
" "	1	Cask*.
" Salicylic	36,477	Pounds.
Ammon. Carb.	800,947	Pounds.
"	94	Casks*.
Argols, or Crude Tartar	22,024,768	Pounds.
Bals. Copaib.	119,000	"
" Peru	5,622	"
" Tolu	26,104	"
" "	23	Cases*.
Bark Cinchona, or other used in the manufacture of Quinine	4,788,044	Pounds.
Beans, Tonka	317,254	"
"	41	Packages*.
Bleaching Powder.	103,087,827	Pounds.
Borax	1,670	"

Buchu Leaves.	136,707	Pounds.
"	4	Barrels*.
Camphor, Crude	2,875,222	Pounds.
Canary Seed	5,317,808	"
Cantharides.	31,604	"
Cardamoms.	270,404	"
Cubebs	67,824	"
Cuttle Bone	151,335	"
"	191	Packages*.
Fenugreek Seed.	34,734	Pounds.
Ginger.	4,414,116	"
"	7,427	Packages*.
Glycerin	12,765,072	Pounds.
Guarana	7,773	"
"	9	Cases*.
Gum Arabic	467,782	Pounds.
Gum Tragacanth	188,343	"
"	21	Cases*.
Hellebore Root	88,587	Pounds.
Hemp Seed	3,020,805	"
Ipecac Root	23,633	"
Insect Powder	261,462	Pounds.
"	80	Kegs*.
Lime Juice	38.98	Gallons.
"	5877	Packages*.
Lycopodium	19,316	Pounds.
Magnesia Carb	27,399	"
"	25	Cases*.
Morphine	16,875	Ounces.
Oil, Aniseed	32,344	Pounds.
Oil, Bergamot	33,318	"
"	439	Cases*.
Oil, Castor	21,986	Pounds.
Oil, Citronella	99,361	"
"	232	Cases*.
Oil, Cloves	4,172	Pounds.
"	13	Cases*.
Oil, Cod Liver	98,319	Gallons.
"	397	Barrels.
Oil, Lavender	47,990	Pounds.
"	284	Cases*.
Oil, Lemon	87,090	Pounds.
"	647	Cases*.
Opium, Crude	568,263	Pounds.
" Prepared for smoking	66,232	"
Quinine	1,949,533	Ounces.
Quicksilver	800,000	Pounds.
Rhubarb	90,842	"
"	390	Cases*.
Saffron	8,692	Pounds.
"	62	Barrels*.

Salicin	1,802	Pounds.
Senna	492,548	"
"	19	Barrels*.
Soap, Castile	2,528,102	Pounds.
"	2,414	Boxes*.
Vanilla Beans	137,479	Pounds.

In the case of items marked thus *, no weight was given in Custom House returns.

SOME FLUCTUATIONS OF THE NEW YORK DRUG MARKET.

TABULATED REPORT OF PACKAGE PRICES.

DRUGS.	1886.					1887.						
	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March.	April.	May.	June.	July.
Balsam Copaiba	$ 30	$ 33	$ 37	$ 36	$ 35	$ 37	$ 38	$ 40	$ 42	$ 42	$ 40	$ 40
" Fir Canada	2 00	2 00	2 15	2 50	2 60	2 65	2 70	2 65	3 25	3 00	2 75	2 60
" " Oregon	1 75	1 75	1 50	1 40	1 50	1 50	1 25	1 35	1 35	1 35	1 25	1 25
" Peru	1 15	1 25	1 30	1 25	1 20	1 20	1 20	1 17½	1 17½	1 15	1 15	1 12½
" Tolu	34	36	38	35	34	33	33	32	32	30	30	31
Berries Cubeb XX	80	85	90	95	1 00	1 10	1 25	1 25	1 15	1 00	80	90
Camphor	22¾	23	23	23	22¼	22¼	22½	23½	23¼	23¼	25	23
Cantharides Chinese	1 50	1 40	1 30	1 30	1 10	1 00	95	95	95	90	80	75
" Russian	2 00	2 00	1 90	1 90	1 85	1 85	1 80	1 75	1 65	1 65	1 60	1 60
Cuttle Fish Bone Trieste	12½	12	12	11½	11½	12	17	16	15	14	15	17
Ergot, Spanish	38	38	35	35	30	35	36	35	34	34	32	30
Flowers, Arnica	07¾	07¾	08	08	08	09	08½	08	08	08	07½	07½
" Chamomile, Ger.	22	21	20	19	19	17	16	15½	15	14½	14½	17
" " Rom.	12	13	14	14	14	12	11½	12	12	11	15	14
Guarana	1 50	1 50	1 45	1 27½	1 60	1 50	1 45	1 40	1 40	1 35	1 25	1 35
Gum Aloes Cape	06½	06½	06½	06	06	06	06	06	06	06	06	06
" " Curaçoa	06	06	06	05½	05½	05	05	05	05	05	05	05½
" Arabic, 1st Trieste	80	80	81	90	90	92	90	90	88	90	90	90
" " Sorts Sifted	43	43	47	52½	52½	57½	57½	57	52½	50	50	60
" Asafœtida	10	10	10	10	10	10	09½	10	10	10	09	08½
" Opium, Prime	2 80	2 90	2 85	3 10	3 25	3 25	3 60	3 80	4 20	4 25	4 63	4 80
" Tragac. Aleppo. 1st	44	43	43	42	42	42	45	44	42	44	43	44
" " Turkish.	85	65	65	65	85	75	75	80	80	80	85	80
Insect Powder, Best	28	30	28	28	40	40	45	45	45	45	45	42
Leaves Buchu, Short	10	08	09	09	10	11	35	25	24	10	07½	07½
" Senna Alex	28	28	32	32	30	30	32	32	32	32	30	30

TABULATED REPORT OF PACKAGE PRICES. (*Continued.*)

DRUGS.	1886.					1887.						
	Aug	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March.	April.	May.	June.	July.
Lycopodium	$ 39	$ 39	$ 43	$ 43	$ 43	$ 43	$ 42	$ 42	$ 40	$ 39	$ 37	$ 37
Mace	43	43	44	44	44	44	52	52	52	54	70	70
Manna, S. F	75	70	70	60	55	52½	50	52	52	50	45	42
Oil, Anise	1 55	1 75	1 70	1 70	1 75	1 75	1 75	1 67½	1 75	1 85	1 95	1 90
" Bergamot, Best	2 60	2 50	2 40	2 20	2 20	2 00	2 00	2 00	2 00	2 00	1 80	2 35
" Cloves	1 50	1 40	1 60	1 60	1 65	1 75	1 75	1 70	1 70	1 60	1 55	1 65
" Cod Liver, N. F	70	65	60	60	60	60	60	60	70	70	65	65
" " Norw. True	27 00	27 00	27 00	27 00	26 00	27 00	27 00	27 00	28 00	28 00	29 00	28 00
" Cubebs	7 25	7 25	7 50	7 50	8 00	9 00	10 00	10 00	8 75	7 50	7 50	7 50
" Lemon, Best	2 50	2 25	2 10	2 00	1 95	2 00	2 00	2 00	2 10	2 00	1 85	1 80
" Peppermint, Pure	3 15	2 85	2 85	2 85	2 95	3 20	3 25	3 25	3 00	2 70	2 90	2 60
" Sassafras, Best	35	36	36	36	37	43	43	40	38	36	35	35
" Wintergreen	2 00	2 00	2 15	2 05	2 00	1 90	1 85	1 85	1 80	1 70	1 90	1 95
Root, Golden Seal	12	13	18	20	22	22	23	22	20	20	17	17
" Gentian	04½	04¼	04¼	04¼	04¼	04½	05	04¾	05	04½	04	04
" Ipecac, Rio	87½	87½	85	80	80	1 10	1 30	1 35	1 60	2 25	1 75	1 75
" Jalap, V. C	12	11	11	11	12	15	15	15	12	12	11	11
" Sarsaparilla, Hond	28	27	28	28	26	26	25	25	24	24	25	24
" Seneka	42	41	41	41	40	40	40	38	36	36	35	34
" Serpentaria	40	38	35	35	37½	38	34	30	30	28	27	25
" Spigelia	50	55	45	45	45	40	40	45	45	45	40	40
Saffron, Valencia	11 00	11 50	11 50	11 50	11 50	11 50	11 50	12 00	11 75	11 75	12 50	12 00
Seeds, Canary, Smyrna	02⅝	02⅝	02⅝	03	03	03¼	03¼	03¼	03¼	03	02⅝	02⅝
" Cardamom, Mal	90	90	85	85	85	90	95	90	90	90	90	90
" Hemp, Russ	02⅝	02½	02¼	02½	02⅜	02⅜	02⅜	02⅜	02⅛	02⅛	02⅛	02¼
" Rape	03⅝	03¾	03¾	03⅝	03⅝	03¾	03¾	03¾	03¾	03¾	04	03¾
Spermaceti, Block	45	44	44	43	41	41	41	41	42½	42	41½	41½

TABULATED REPORT OF BULK PRICES.

CHEMICALS.	1886.					1887.						
	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March.	April.	May.	June.	July.
Acid, Carbolic	$0 23	$0 21	$0 20	$0 21	$0 22	$0 35	$0 49	$0 45	$0 35	$0 32	$0 30	$0 32
" Citric	65	63	59	58	58	61	58½	53	50	52	48½	52
" Oxalic	06¾	06¾	07	07	07	07	07¾	07	08	08	08½	08¼
" Tartaric, powdered	44	44	44	44	44	44	44	44	44	44	44	44
Alcohol	2 12	2 12	2 17	2 17	2 17	2 17	2 17	2 17	2 15	2 04	2 04	2 04
Ammon Carb.	09	08¾	08¾	08¾	08⅝	09	08½	08½	08¼	08	07¾	08
Antipyrene.	1 25	1 25	1 25	1 25	1 25	1 25	1 25	1 25	1 22	1 22	1 25	1 25
Borax	06½	06½	06	06	05¾	06½	06⅜	06½	06½	06⅜	06¼	06½
Cinchonidia Sulphate	13	13	13	13	13	13	13	13	13	12	11	11
Cocaine Hydrochlor	7 25	7 25	6 50	6 50	5 25	5 75	5 75	5 25	6 40	6 40	5 75	5 75
Cream Tartar, powdered.	36	36	36½	35¾	36	35¾	35¾	35¾	35¾	35¾	35¾	35¾
Glycerin	14	14	17	24	24	26	22	22	21	22	21	21
Iodin Resub.	3 25	3 25	2 85	2 85	2 60	4 00	4 10	4 10	4 10	4 10	4 10	4 10
Morphia Sulphate	1 95	1 95	1 95	2 10	2 20	2 30	2 70	2 95	2 95	2 95	2 95	3 20
Potash Bromide.	35	34	33	33	33	33	38	38	38	38	38	38
" Iodide	2 60	2 50	2 30	2 30	2 10	2 75	2 75	2 75	2 85	2 85	2 85	2 75
Quicksilver	52	56	55	54	53	53½	53	54	53	52	50	50
Quinine, R. & S.	58	58	58	58	58	63	63	55	51	51	51	48
Salicin	1 50	1 95	1 95	1 95	1 70	10 00	7 50	3 00	3 50	3 20	3 00	3 25

AUGUST 1887.

ALFRED H. MASON, F.C.S., F.R.M.S.,
Chairman Committee on the Drug Market.

REPORT

OF THE

COMMITTEE ON LEGISLATION,

FOR THE YEAR 1886-1887.

BY CHARLES W. DAY, CHAIRMAN.

During the past year pharmacy laws have been enacted in four States and two Territories, namely, Alabama, Colorado, Nebraska, Pennsylvania, Dakota and Idaho. Amendments to existing laws have been secured in Illinois, Kansas, Michigan and Wisconsin.

Copies of these Acts are submitted with this report, together with the Wyoming pharmacy law, a copy of which the legislative committee for last year were unable to procure in time for publication.

Alabama.—The Board of Pharmacy consists of three members selected by the Governor from among the most prominent pharmacists of five years' experience and resident that term in the State.

All persons engaged in drug business at the time the law went into effect, and all assistants over eighteen years of age, in towns of one thousand inhabitants, were entitled to registration without examination if application was made within sixty days from the time the law took effect. Registration is required to conduct a pharmacy in any town having a population of one thousand, or within two miles of such town, under penalty of from $25.00 to $100 00 for each offense. Graduates in pharmacy, from colleges requiring four years' experience, and physicians are entitled to registration without examination.

Registered pharmacists are held responsible for the quality of their goods, except those in original packages. Adulteration is punished by a fine of $100 and name of offender stricken from the register. The fee for registration without examination is $2.00—by examination $3.00.

Itinerant venders of medicines must pay a license fee of $100 per annum. The certificate of registration must be displayed conspicuously, under penalty of $5 per month.

The State appropriates $500 annually out of the licenses received from itinerant venders, if there be need of it, to meet the expenses of the Board, the surplus to be divided between the State Treasury and Pharmaceutical Association.

There is a schedule of poisons which must be labeled when sold, and must not be sold unless the purchaser is aware of the poisonous character and represents that they are to be used for a legitimate purpose.

It is the duty of the State's Attorney to prosecute all violations.

The board consists of P. C. Candidus, Mobile, three years; E. P. Galt, Selma, two years; and P. O. Patton, Montgomery, one year.

Colorado.—The Pharmacy Act of this State provides that the Governor shall appoint five persons from among such competent pharmacists as have had ten years' practical experience in the capacity of dispensing pharmacists to constitute the State Board of Pharmacy. The members of the first Board to be appointed for one, two, three, four and five years, and the Governor to appoint a registered pharmacist of ten years' practical experience to fill vacancies annually occurring, the term of office to be five years.

Graduates of such schools or colleges of pharmacy as are approved by the Board of Pharmacy, and who before graduation have had four years' practical experience, and persons of four or more years' experience, and who pass a satisfactory examination, are entitled to registration, and are designated "registered pharmacists." Persons more than eighteen years of age and of two or more years' experience, and who pass a satisfactory examination, are termed "licentiates in pharmacy."

Persons engaged in business on their own account when the law took effect are registered as "licentiates in pharmacy;" so also any manager, assistant or clerk, actively engaged in either capacity at the time the law took effect secures like registration.

The Board may grant certificates to such licentiates of other Boards as it may deem worthy.

The law thus establishes two classes of certificates, the first obtained only by examination or graduation.

The Board are further required to issue without fee minor certificates to competent persons of two years' experience, which certificates shall entitle the holders to sell drugs and medicines in towns of less than five hundred inhabitants.

Each member of the Board receives $5.00 for each day of service and legitimate expenses—the Secretary an additional salary which shall not exceed three hundred dollars. Meetings must be held at least once in four months; receipts in excess of expenditures to be held by the Secretary to meet expenses of the Board.

The examination fee is $5.00; the registration fee of Assistant, $2.00; of graduates in pharmacy, $2.00, with annual renewal fee of not to exceed $2.00 for each of these classes; the fee for registration, because of having been in business when the law took effect, is *ten dollars*, with annual renewal fee of *ten dollars*.

Penalty for acting as a pharmacist by unregistered persons, is $500.

Adulteration is punished by a fine of not less than $50, nor more than $500.

Prosecutions to be conducted by the State's Attorney, and all penalties collected to be paid to the board of pharmacy.

The following gentlemen constitute the Board: John Best, Central; Charles W. Ford and William Dingle, Denver; S. T. Kostich, Leadville; and R. R. Taylor, Colorado Springs.

Dakota.—The pharmacy law creates two Boards of three members each, one for the northern and one for the southern part of the territory, the members to be appointed by the Governor from names presented by the Dakota Pharmacy Association and Southern District Pharmacy Association.

Graduates in pharmacy, persons engaged in business on their own account, and clerks having had five consecutive years' experience and employed as pharmacists in Dakota, at the passage of the act, are entitled to registration without examination.

The fee for examination cannot exceed $2.00; for assistants, 50 cents.

All fees accrue to the Board.

Section 13 holds druggists responsible for the quality of the goods they handle, and fixes a penalty for falsifying or adulterating drugs; and another section provides for the proper sale of poisons, and defines a "poison" as any drug, chemical or preparation which, according to standard works on Materia Medica or Medicine, is liable to be destructive to adult human life in quantities of sixty grains or less.

Pharmacists are exempt from jury duty.

H. L. Haussamen, Grafton, Frank Frisby, Bismarck, and E. C. Maxey, Fargo, constitute the North Dakota Board, and H. L. Warne, Mitchell, D. S. White, Flandreau, and J. L. Kreychie, Iroquois, the South Dakota Board of Pharmacy.

Nebraska.—The Board of Pharmacy consists of the Attorney-General, Secretary of State, Auditor, Treasurer and Commissioner of Public Lands and Buildings, who appoint a Board of five examiners, who shall be skillful retail apothecaries of seven years' practical experience, who shall receive as compensation $5.00 for each day engaged and necessary expenses. Said examiners to be selected from the persons recommended by the Nebraska Pharmaceutical Association.

It is the duty of this Board of Examiners to cause the prosecution of persons who violate the law, to hold meetings for the examination of applicants for examination, and to furnish an annual report of its proceedings, and names of pharmacists registered, to the Governor; also an annual report to the State Auditor of moneys received and disbursed.

All moneys received in excess of allowances to be paid into the State Treasury at the end of each year.

Persons engaged in business when the law took effect, and persons who had been engaged or employed three years prior to the taking effect of the act, as pharmacists, in the compounding of physicians' prescriptions, and were at that time so employed, are entitled to registration; provided application was made within three months after the law took effect. Fee, $2.00.

The qualifications for registration for other applicants, not less than eighteen years of age, are temperate habits and a satisfactory examination; the fee is $3.00; and in case of failure, the applicant is entitled to a second examination for the same fee.

Assistants engaged in the business at the time when the law took effect, and for two or more years prior, are entitled to registration as such; but such registration does not entitle holder to take charge of a drug store.

Annual renewals are provided for; the fee for pharmacists is $1, assistants fifty cents.

There is a section making adulteration or substitution a misdemeanor, and the penalty for violation of its provisions is $10 to $100, for other violations the same fine or imprisonment. Pharmacists are exempt from jury duty.

The Board consists of W. C. Lane, Lincoln; Henry Boyden, Grand Island; A. E. Stritz, North Platte; Max Brecht, Omaha; and Henry Cook, Red Cloud.

Pennsylvania.—This law provides for the appointment of an Examining Board by the Governor, of five persons of ten years' experience as retail apothecaries, to serve one, two, three, four and five years respectively, and thereafter one person annually with the above qualification to serve five years; the compensation is $5 for each day actually engaged, and all legitimate and necessary expenses.

Persons conducting the business of retail apothecaries, or those acting in the capacity of qualified assistants therein are registered without examination, the fee to be $1, for registration by examination the fee is $2. Persons applying for examination for certificate to entitle them to carry on the retail drug or apothecary business must produce evidence of having had four years' practical experience, and those applying for examination for assistants' certificate must produce evidence of having had two years' experience. A triennial renewal is necessary, the fee not to exceed $1. The fees are to be applied to the salary and expense account of members.

The Board is empowered to grant registration to graduates in medicine who have had three years' continuous practice since the date of diploma.

Nothing in the act is to interfere with the sale by unregistered storekeepers of "the commonly used medicines and poisons" if said articles are free from adulteration and in case of poisons plainly labeled.

Adulteration is punished by a fine not exceeding $500. A book must be kept for entering sales of poisons which are known to be destructive to human life. (Exemptions—poisonous articles specified in physicians' prescriptions and sales to agriculturists of articles commonly used as insecticides.)

The Examining Board is charged with the duty of prosecuting violators of the law. The Board consists of Alonzo Robbins, Philadelphia; H. B. Cochran, Lancaster; Frederick H. Eggers, Allegheny City; H. A. Tafel, Philadelphia, and A. B. Burns, Montrose.

The High License bill provides that druggists may sell intoxicating liquors upon prescriptions of physicians without being required to obtain license, and alcohol or any preparation containing the same, for scientific or mechanical purposes.

Wyoming.—The Governor appoints three registered pharmacists, representing the different portions of the Territory, who have resided in the Territory two years, and of at least five years' practical experience in their profession, to constitute the Commissioners of Pharmacy, their term of office to be two years.

All persons engaged in the drug business at the time of the passage of the Act were entitled to registration without examination, if they had three years' experience as owners or principals.

Assistants, in order to become registered, must have had three years' experience, and pass an examination before the Commissioners.

Graduates of such schools of pharmacy as require four years' experience are entitled to registration without examination. The fee for registration by examination is ten dollars, which is not returned in case of failure, and for registration without examination three dollars.

The adulteration of drugs is made a misdemeanor, the penalty not to exceed one hundred dollars.

A book must be kept for the entry of sales of poisons, which sales must be labeled with skull and crossbones, the word "poison," and name and place of business of the seller, and the purchaser is to be made aware of the poisonous nature of the article. No penalty, however, attaches to a violation of this section.

The penalty for conducting a pharmacy, or for using the title of registered pharmacist by unregistered persons, is not less than $25, and not more than $100.

The fees for registration go to the Commissioners.

Idaho.—There is a Board of Pharmacy in each county, consisting of three reputable practicing pharmacists or physicians, the appointments being made by the County Commissioners.

All persons engaged in drug business when the law took effect, and graduates of such colleges or schools of Pharmacy as are approved by the Board of Pharmacy, are entitled to registration without examination.

A minor certificate is provided for, the holder of which is entitled to act as a proprietor in towns and villages of not more than five hundred inhabitants.

Persons engaged as assistants or clerks, at the time the law went into effect, not less than eighteen years of age, and with two years' experience, are entitled to registration as "registered assistants."

The fee for examination is $10.00, for registration without examination, $5.00.

For Assistants the fee is $1.00.

Annual renewal of registration is provided for.

There is an adulteration section, also a poison section.

It is the duty of the State's Attorney to prosecute all violations.

AMENDMENTS.

Illinois.—An amendment to the pharmacy law in force July 1, 1887, abolishes diploma distinctions, admits only licentiates and persons heretofore registered as assistants to registration as pharmacists, and cancels the registrations of pharmacists and assistants whose certificates were not in force July 1, 1887.

Kansas.—An amendment admits to registration all persons who were engaged as clerks or proprietors of five years' experience, two of which must be in the State of Kansas, and graduates in pharmacy.

All applicants must satisfy the Board of moral fitness and sobriety.

All fees collected to be held by the treasurer to meet the expenses of the Board.

Any pharmacist convicted of a violation of the prohibitory liquor law forfeits his registration.

Sales of poisons can be made under certain restrictions, but must be registered in a record to be kept for the purpose.

Provision is made for the examination of clerks, for the employment of apprentices, and for an annual report by the Board of Pharmacy to the Governor to be made on or before the 10th day of January.

This amendment provides that subsequent appointments of members of the Board of Pharmacy shall be made from persons recommended by the State Pharmaceutical Association.

Michigan.—The pharmacy law of Michigan is amended by an act, approved June 18th, 1887, which provides that any retail dealer may vend patent or proprietary medicines, provided such dealer *has been in such business* three years or more; and further provides that almost everything else in common demand in a drug store may be sold by any person, provided it bears a label with the name of the pharmacist or druggist putting up the same, with proper dose, and in case of poisons, name or names of the most common antidotes. Also, that any person engaged three years next previous to the second day of June, 1885, and who was so engaged at said time, shall be registered for a fee of $2.00; provided application is made within three months from the time the amendment takes effect.

A certificate of registered assistant is provided for, by examination for persons not less than sixteen years of age; fee, $1.00.

Ohio.—The pharmacy law is amended as follows: No unregistered person can lawfully compound or dispense prescriptions, except under the supervision of a registered pharmacist or his qualified assistant.

Registered assistants cannot lawfully pursue their vocation in a drug store that is not under the management and supervision of a registered pharmacist. Any person violating this provision shall be liable to a penalty not exceeding $50.00.

It is made the duty of the Ohio Board of Pharmacy to prosecute all persons violating the provisions of this act.

Nothing in the act is to be construed as effecting the right of any person to bring a civil action for any act for which the same may now be brought.

Wisconsin.—The pharmacy law is amended by requiring five years' experience instead of two years, as heretofore, for Licentiates in pharmacy. The certificates of assistants will permit them to act as assistants anywhere, but as proprietors in villages of five hundred inhabitants or less only.

A penalty is imposed of not less than five nor more than ten dollars for failure to conspicuously expose certificates of registration.

Formerly the Board of Pharmacy were entitled to one-half the penalties collected; but under the amended law all penalties collected inure to the school fund of the State.

There have been two new sections added to the Revised Statutes of Wisconsin, which provide:

Town and village Boards and the Common Councils of towns, villages and cities may issue permits for the sale of intoxicating liquors for medicinal, mechanical, and scientific purposes, for ten dollars per annum. A record of such sales must be kept and report made to the city, village or town clerk, on the third Tuesday of April of each year, together with a verified copy of all entries made in the record above referred to.

A fine of not less than ten nor more than forty dollars is imposed for false statement to induce sales of liquors by a registered pharmacist in violation of law.

ALABAMA PHARMACY LAW.

AN ACT (H. B. 154.)

To regulate the practice of pharmacy, and the sale of poisons, in cities and towns of more than 1,000 inhabitants in the State of Alabama.

SECTION 1. *Be it enacted by the General Assembly of Alabama,* That from and after the passage of this act, it shall be unlawful for any person not a registered pharmacist, within the meaning of this act, to conduct any pharmacy, drug store, apothecary shop, or store, located in any village, town or city in the State of Alabama, of more than 1,000 inhabitants, or within two miles of any incorporated city or town of more than 1,000 inhabitants, for the purpose of retailing, compounding or dispensing medicines or poisons for medical use, except as hereinafter provided.

SEC. 2. *Be it further enacted*, That it shall be unlawful for the proprietor of any store or pharmacy in any village, town, city in the State of Alabama, of more than 1,000 inhabitants, or within two miles of any incorporated city or town of more than 1,000 inhabitants, to allow any person except a registered pharmacist to compound or dispense the prescriptions of physicians, or to retail or dispense poisons for medical use, except as an aid to, and under the supervision of a registered pharmacist. Any person violating the provisions of this section, shall be deemed guilty of a misdemeanor, and on conviction shall be liable to a fine of not less than $25, nor more than $100 for each and every offense.

SEC. 3. *Be it further enacted*, That the Governor shall appoint three persons from among the most prominent pharmacists of the State, all of whom shall have been residents of the State for five years, and of at least five years' practical experience in their profession, who shall be known and styled "Board of Pharmacy for the State of Ababama," one of whom shall hold his office for one year, one for two years, and one for three years, and each until his successor shall be appointed and qualified; and each year thereafter another commissioner shall be so appointed for three years, and until a successor is appointed and qualified. If a vacancy occur in said Board, another commissioner shall be appointed as aforesaid to fill the unexpired term thereof. Said Board shall have power to make By-Laws and all necessary regulations, and create Auxiliary Boards, if necessary, for the proper fulfilment of their duties under this act, without expense to the State.

SEC. 4. *Be it further enacted*, That the Board of Pharmacy shall register in a suitable book the names and places of residence of all persons to whom they issue certificates, and dates thereof. It shall be the duty of said Board of Pharmacy to register, without examination, as registered pharmacists, all pharmacists and druggists who are engaged in business in the State of Alabama, at the passage of this act, as owners or principals of stores or pharmacies in any village, town, or city of more than one thousand inhabitants, for selling at retail, compounding or dispensing drugs, medicines or chemicals, for medicinal uses or compounding or dispensing physicians' prescriptions, and all assistant pharmacists eighteen years of age, engaged in said stores or pharmacies in any village, town or city of more than one thousand inhabitants in the State of Alabama, at the passage of this act, and who have been engaged as such in some store or pharmacy where physicians' prescriptions were compounded or dispensed: *Provided, however*, that in case of failure or neglect on the part of any person or persons to apply for registration within sixty days after they shall have been notified by said Board of Pharmacy for the State of Alabama, they shall undergo an examination as is provided for in section five of this act.

SEC. 5. *Be it further enacted*, That the said Board of Pharmacy shall upon application and at such time and place, and in such manner, as they may determine, either by a schedule of questions to be answered and subscribed to under oath, or orally, examine each and every person who shall desire to conduct the business of selling at retail, compounding or dispensing drugs, medicines, or chemicals for medicinal use, or compounding or dispensing physicians' prescriptions, as pharmacists, and if a majority of said Board shall be satisfied that said person is competent and fully qualified to conduct said business of compounding or dispensing drugs, medicines, or chemicals for medicinal use, or to compound or dispense physicians' prescriptions, they shall enter the name of such person as a registered pharmacist in a book provided for in section four of this act; and that all graduates in pharmacy, that require a practical experience in pharmacy of not less than four years before granting a diploma, shall be entitled to have their names registered by said Board without examination; *Provided, however*, That this act shall not be so construed as to prevent any physician who is authorized to practice medicine or surgery under the laws of the State, from registering as a druggist or pharmacist without examination: *Provided*, That any person or persons, not a pharmacist or druggist, may open and conduct such store if he or they keep constantly in their employ a registered pharmacist or druggist; but shall not himself or themselves sell or dispense drugs or medicines, except proprietary and patent medicines in original packages.

SEC. 6. *Be it further enacted*, That the Board of Pharmacy shall be entitled to demand and receive of each person whom they register and furnish a certificate as a registered pharmacist without examination the sum of $2, and from each and every person that they examine orally, or whose answers to a schedule of questions are returned, subscribed to under oath, the sum of $3, which shall be in full for all services; and in case the examination of said person shall prove defective and unsatisfactory and his name not be registered, he shall be permitted to present himself for examination within any period not exceeding twelve months thereafter, and no charge shall be made for such examination.

SEC. 7. *Be it further enacted*, That every registered pharmacist, apothecary, and owner of any store, shall be held responsible for the quality of all drugs, chemicals, or medicines he may sell or dispense, with the exception of those sold in original packages of the manufacturer, and also those known as proprietary and patent medicines; and should he knowingly intermingle and fraudulently adulterate, or cause to be adulterated, such drugs, chemicals, or medical preparations, he shall be deemed guilty of a misdemeanor, and upon conviction thereof be liable to a penalty not exceeding $100, and in addition thereto his name shall be stricken from the register.

SEC. 8. *Be it further enacted*, That it shall be unlawful for any person from and after the passage of this act, to retail any poisons enumerated below: arsenic and its preparations, corrosive sublimate, white and red precipitate, biniodide of mercury, cyanide of potassium, hydrocyanic acid, strychnine and all other poisonous vegetable alkaloids and their salts, and the essential oil of almonds, opium and its preparations, except paregoric and other preparations of opium containing less than two grains to the ounce, aconite, belladonna, colchicum, conium, nux vomica, henbane, savin, ergot, cotton root, cantharides, creosote, veratrum, digitalis, and their pharmaceutical preparations, croton oil, chloroform, chloral hydrate, sulphate of zinc, mineral acids, carbolic and oxalic acids, without labeling the box, vessel, or paper in which said poison is contained with the name of the article, the word poison, and the name and place of business of the seller. Nor shall it be lawful for any person to deliver or sell any poisons enumerated above, unless upon due inquiry it be found that the purchaser is aware of its poisonous character and represents that it is to be used for a legitimate purpose. The provisions of this section shall not apply to the dispensing of poisons in not unusual quantities or doses upon the prescription of practitioners of medicine. Any violation of this section shall make the principal of said store liable to a fine of not less than $10 nor more than $100. Provided, however, that this section shall not apply to manufacturers making and selling at wholesale any of the above poisons, and provided that each box, vessel, or paper in which said poison is contained shall be labeled with the name of the article, the word poison, and the name and place of business of the seller.

SEC. 9. *Be it further enacted*, That any itinerant vender of any drug, poison, ointment or appliance of any kind intended for treatment of any disease or injury, who shall, by writing or printing, or any other method, publicly profess to cure or treat disease or injury or deformity by any drug, nostrum or manipulation, or other expedient, shall pay a license of $100 per annum to the State, to be paid in the manner for obtaining public license, or according to the usual laws in force for that purpose.

SEC. 10. *Be it further enacted*, That any person who shall procure or attempt to procure registration for himself or for another under this act, by making or causing to be made false representations, shall be deemed guilty of a misdemeanor, and shall, upon conviction thereof, be liable to a penalty of not less than $25, nor more than $100; and the name of the person so falsely registered shall be stricken from the register. Any person not a registered pharmacist as provided for in this act, who shall conduct such a store, pharmacy, or place for retailing, compounding or dispensing drugs, medicines or chemicals, for medical use, or for compounding or dispensing physicians' prescriptions, or who shall take, use or exhibit the title of registered pharmacist, shall be guilty of a misdemeanor, and, upon conviction thereof, shall be liable to a penalty of not less than $100.

SEC. 11. This act shall not apply to physicians putting up their own prescriptions, nor to the sale of proprietary medicines.

SEC. 12. *Be it further enacted*, That it shall be the duty of every registered pharmacist to conspicuously post his certificate of registration in his place of business. Any person who shall fail to comply with all the provisions of this section, shall be liable to a fine of $5 for each calendar month during which he is delinquent.

SEC. 13. The sum of $500 a year, or as much thereof as may be found necessary, is hereby appropriated out of the money so received for license for the expense of said Board of Pharmacy. All surplus over and above said amount to be divided as follows: One-half to the Pharmaceutical Association, the remainder to be paid into the State Treasury.

SEC. 14. All suits for the recovery of the several penalties prescribed in this act shall be presented in the name of the State of Alabama in any court having jurisdiction, and it shall be the duty of the State's Attorney of the county wherein such offence is committed to present all persons violating the provisions of this act upon proper complaint being made.

SEC. 15. *Be it further enacted*, That all laws and parts of laws in conflict with the provisions of this act be and the same are hereby repealed.

Approved February 28, 1887.

Official: C. C. LANGDON, *Secretary of State.*

For registration and examination, application should be made to E. P. Galt, Secretary, Selma, Alabama.

COLORADO PHARMACY LAW.

A BILL FOR AN ACT TO REGULATE THE PRACTICE OF PHARMACY, AND THE AUTHORIZING OF PERSONS COMPETENT TO CARRY ON SUCH PRACTICE, IN THE STATE OF COLORADO.

Be it enacted by the General Assembly of the State of Colorado:

SECTION 1. That it shall hereafter be unlawful for any person, other than a registered pharmacist or licentiate in pharmacy, to retail, compound or dispense drugs, medicines, or pharmaceutical preparations, in the State of Colorado, or to institute or conduct any pharmacy, store, or shop, for the retailing, compounding or dispensing of drugs, medicines, or pharmaceutical preparations, in said State of Colorado, unless such person shall be a registered pharmacist or licentiate in pharmacy, duly authorized as this act provides, or shall place in charge of said pharmacy, store, or shop, a registered pharmacist or duly authorized licentiate in pharmacy, except as hereinafter provided.

SEC. 2. Any person who has had four years' experience in a pharmacy where the prescriptions of medical practitioners are compounded, and shall have sustained a satisfactory examination before the State Board of Pharmacy hereinafter mentioned, shall be designated a "registered pharmacist," and be furnished with an appropriate certificate setting forth his superior distinction.

SEC. 3. Graduates in pharmacy who have obtained diplomas from such colleges or schools of pharmacy as shall be approved of by the Board of Pharmacy, and who, previous to obtaining said diplomas, have had four years' practical experience in the dispensing and compounding of physicians' prescriptions, may, on payment of the fee hereinafter provided, be made registered pharmacists.

SEC. 4. Any person more than eighteen years of age, who has had two or more years' experience in the dispensing and compounding of physicians' prescriptions, and shall have sustained a satisfactory examination before the State Board of Pharmacy, shall be designated a licentiate in pharmacy, and be granted a certificate accordingly.

SEC. 5. Every person applying for registration under this act, who shall, within three months after the passage of this act, forward to the State Board of Pharmacy satisfactory proof, supported by his affidavit, that he was engaged in the business of a retail pharmacist on his own account in the State of Colorado at the time of the passage of this act, shall, upon payment of a fee hereinafter provided, be granted a certificate of registration as licentiate in pharmacy; *Provided*, That in case of failure or neglect to register as herein specified, then such person shall, in order to obtain registration, comply with the requirements of sections 2, 3 or 4, of this act.

SEC. 6. Any manager, assistant or clerk in a pharmacy who is actively engaged as such at the time of the passage of this act, who is over eighteen years of age and has had two or more years' experience in the dispensing and compounding of physicians' prescriptions previous to the passage of this act, who shall, within three months after the passage of this act, furnish the Board of Pharmacy satisfactory evidence to that effect, shall, upon payment of a fee hereinafter provided, be granted a certificate as licentiate in pharmacy; *Provided*, That in case of failure or neglect to register as herein specified, then such person shall, in order to obtain registration, comply with the requirements of sections 2, 3 or 4 of this act.

SEC. 7. The Board of Pharmacy may grant certificates to such licentiates of other State Boards as it may deem worthy of the same; but the degree of registered pharmacist shall only be conferred as provided in sections 2 and 3 of this act. It shall be the duty of said Board to grant, in towns or camps of less than five hundred inhabitants, minor certificates to such persons as they may deem competent to sell or vend such medicines, compounds or chemicals as are required by the general public; *Provided*, That such persons shall have had at least two years' experience in the sale of medicines and compounding of physicians' prescriptions. Said certificates shall not entitle the holders thereof to registration in towns of more than five hundred inhabitants.

SEC. 8. Licentiates in pharmacy shall not be permitted to engage in the business of dispensing pharmacists on their own account, nor assume the management of such business for others, except as provided in section 7, unless they shall have had five years' practical experience in the dispensing and compounding of physicians' prescriptions previous to the passage of this act, and shall have furnished satisfactory evidence of this fact to the State Board of Pharmacy; then it shall be the duty of said Board to make proper recognition of this fact.

SEC. 9. Immediately upon the passage of this act, the Governor of the State of Colorado shall appoint five persons from among such competent pharmacists as have had ten years' practical experience in the capacity of dispensing pharmacists, and the said five pharmacists shall constitute the Board of Pharmacy of the State of Colorado, to have and to hold office for the terms of one, two, three, four and five years, as respectively designated in their appointments, or until their successors have been duly appointed and qualified.

Annually thereafter the Governor shall appoint a registered pharmacist of ten years' practical experience, to fill vacancies annually occurring. The term of office shall be five years, or until a successor shall be appointed and qualified. In case of resignation, or removal from the State of Colorado, of any member of said Board, or of a vacancy occurring from any cause, the Governor shall appoint a registered pharmacist to serve as a member of the Board for the remainder of the unexpired term.

Within ten days after receiving notice of his appointment, each member of said Board shall appear before a properly qualified officer of the county in which he may reside, and make and subscribe an oath that he will faithfully and impartially perform the duties of his office.

SEC. 10. The said Board shall, within thirty days after its appointment, meet in the city of Denver and organize by the selection of a President and Secretary from among its own members, who shall be elected for the term of one year, and shall perform the duties prescribed by the Board.

Meetings for the examination of applicants for registration, granting of certificates, and the transaction of other necessary business, shall be held at least once in four months, and at such time and place as may be fixed upon by the Board. *Provided,* That thirty days' public notice of the time and place of such meeting shall be given.

Three members of said Board shall constitute a quorum.

It shall be the duty of said Board to receive all applications for registration, submitted in proper form, to grant certificates to such persons as may be entitled to the same under this act, to cause the prosecution of all persons violating any of the provisions of this act, to report annually to the Governor upon the condition of pharmacy in the State, which report shall furnish, also, a record of the proceedings of said Board for the year, as well as the names of all pharmacists and licentiates registered in the State; to keep a book for registration, in which shall be entered the names and places of business of all persons registered under this act; on what grounds and under which particular section of this act each was registered, and any other facts pertaining to the granting of certificates.

The said Board shall have power to make By Laws for the full and proper execution of its duties under this act, to prescribe the forms and methods of application, examination and registration, to demand and receive from applicants the fees herein provided, which, together with the fines collected for violations of this act, shall be held by the Board and applied to the payment of salaries, and other necessary expenses incident to a full discharge of its duties.

SEC. 11. The salaries of said Board shall be five dollars to each member for each day of actual service, and all legitimate expenses incurred in attending the meetings of said Board.

The Secretary of said Board shall receive an additional salary, to be fixed by the Board, and not to exceed three hundred dollars per annum; *Provided,* That no part of the salaries or expenses of the Board shall be paid out of the State Treasury.

All moneys received in excess of these expenditures shall be held by the Secretary of said Board, as a special fund for meeting future expenses of the Board, said Secretary giving such bonds as the Board shall from time to time direct.

In its annual report to the Governor said Board shall render an account of all moneys received during the year, and disbursed, pursuant to this act.

SEC. 12. Every person claiming the right of registration under Section 5 of this act shall, before a certificate be granted him, have paid to the Secretary of the State Board of Pharmacy, a fee of ten dollars, and annually thereafter, on payment of a like sum, a renewal of said certificate shall be issued; the time of such annual payment to be fixed by the Board; *Provided,* That in case of failure or neglect to register or renew certificate as herein specified, then such person shall, in order to be registered, comply with the requirements of Sections 2, 3 and 4 of this act.

SEC. 13. Every person desirous of registering under section 2 of this act shall before examination be held, have deposited with the Secretary of said Board a fee of five dollars; then on presenting himself at the time and place directed by the Board, and sustaining a satisfactory examination, he shall be granted a certificate as registered pharmacist.

Likewise every person applying for registration under section 4 of this act, shall, before examination be held, have deposited with the Secretary of the Board the fee of five dollars, and if he sustains a satisfactory examination be granted a certificate as a licentiate in pharmacy: *Provided*, That in all cases where candidates fail to pass examination, or for other reasons are refused registration, the fees advanced by them shall be refunded.

SEC. 14. Every person claiming the right of registration under section 6 of this act shall, before a certificate be granted him, have paid to the Secretary of the Board of Pharmacy a fee, to be fixed by the Board, but which shall in no case exceed two dollars. A like fee shall be paid by all persons registering under sections 3 and 7 of this act.

SEC. 15. Every registered pharmacist and such licentiates in pharmacy as are registered under sections 4, 6 and 7 of this act, who desire to continue in the pursuit of pharmacy in the State of Colorado, shall annually thereafter, during the time of such continuance, pay to the Secretary of the Board of Pharmacy, at such time as the Board may direct, a registration fee, to be fixed by the Board, but which shall in no case exceed two dollars; in return for said fee a new certificate shall be issued. All certificates to licentiates in pharmacy shall specify under which particular section of this act each certificate was granted; and if licentiate be competent, in the meaning of this act, to engage in business on his own account, in the State, it shall be so indicated.

SEC. 16. Any person who is not a registered pharmacist nor a licentiate in pharmacy, duly authorized under this act to do business on his own account, who shall, after the expiration of three months from the passage of this act, keep a pharmacy, store or shop, for the dispensing and compounding of physicians' prescriptions, and shall not have in his employ in said pharmacy, store or shop, a registered pharmacist, nor licentiate in pharmacy, authorized by the State Board to manage a pharmacy, shall for each and every such offense, be liable to a fine of five hundred dollars.

SEC. 17. Any person, not registered under this act, who shall take, use or exhibit the title of registered pharmacist or licentiate in pharmacy, shall be liable to a fine of one hundred dollars for each and every such offense; a like penalty shall attach to any licentiate in pharmacy who shall, without authority, take, use or exhibit the title of registered pharmacist in the State of Colorado.

SEC. 18. Any proprietor of a pharmacy, or other person, who shall permit the compounding and dispensing of physicians' prescriptions, or the vending of drugs, medicines or pharmaceutical preparations in his store or place of business, except by a registered pharmacist or licentiate in pharmacy, or under the immediate supervision of one, or who, while continuing in the pursuit of pharmacy in the State of Colorado, shall fail or neglect to procure his annual registration, and any person who shall wilfully make any false representation to procure for himself, or for another, registration, or shall violate any other provision of this act, shall, for each and every such offense, be liable to a penalty of one hundred dollars: *Provided*, That nothing in this act shall interfere with the business of those merchants who keep on sale such poisons, acids and chemicals as are regularly used in agriculture, mining, and the arts, when kept and sold for such purposes in sealed and plainly labeled packages: *Provided, also*, That nothing in this act shall, in any manner, interfere with the business of any physician in regular practice, nor prevent him from supplying to his patients such articles as may to him seem proper; nor with the making or vending of such proprietary and patent medicines, placed in sealed packages, bearing the name of the article and of the manufacturer; nor with the exclusively wholesale business of any dealers, except as hereinafter provided.

SEC. 19. The proprietors of all pharmacies shall be held responsible for the quality of all drugs and medicines and chemicals sold or dispensed at their respective places of business, except patent and proprietary preparations and articles sold in the original packages of the manufacturer. Any person who shall adulterate or alter, or cause or permit to be adulterated or altered, any drug, medicine, or pharmaceutical preparation, or shall sell or offer for sale any such adulterated or altered article, and any person who shall substitute or cause to be substituted one material for another, with the intention to deceive or defraud the purchaser, shall be guilty of a misdemeanor, and liable to prosecution therefor. If convicted, he shall pay a fine, not less than fifty dollars nor more than five hundred dollars, for each and every such offence, besides all the costs incurred in investigation and trial. All suits for the recovery of the several penalties prescribed by this act, shall be prosecuted in the name of The People of the State of Colorado, in any court of competent jurisdiction; and it shall be the duty of the State's Attorney where such offence is committed to prosecute all persons violating any of the provisions of this act, upon proper complaint being made. All penalties collected for such violations shall be paid to the State Board of Pharmacy, to be held by said Board as heretofore directed.

SEC. 20. This act shall be in force from and after its passage and publication.

NEBRASKA PHARMACY LAW.

AN ACT TO REGULATE THE PRACTICE OF PHARMACY IN THE STATE OF NEBRASKA.

SECTION 1. That there shall be established in the State of Nebraska a Board to be styled the Nebraska State Board of Pharmacy. Said Board shall consist of the Attorney-General, Secretary of State, Auditor, Treasurer, and Commissioner of Public Lands and Buildings, and said Board shall appoint five examiners, or secretaries, who shall be skillful retail apothecaries of seven years' practical experience, actually engaged in said business in the State of Nebraska, and said secretaries shall assist said Board in conducting all examinations hereinafter provided for, and in the performance of any of its duties. Each of said secretaries shall receive a compensation of $5 per day for each day's service actually and necessarily performed, and such necessary expenses as shall be audited and found just and reasonable by said Board for attending the meetings thereof, said secretaries or examiners to be selected from ten practical pharmacists recommended by the Nebraska State Pharmaceutical Association; *Provided*, That all such services and expenses, and all the necessary expenses of said Board, shall be paid out of the moneys received by said Board for fees. All moneys received in excess of said per diem allowance, and other expenses above provided for, shall be paid into the State Treasury at the end of each year, and so much thereof as shall be necessary to meet the current expenses of said Board shall be subject to the order thereof, if, in any year, the receipts of said Board shall not be equal to its expenses. The Board shall make an annual report, and render account to the State Auditor and to the Nebraska State Pharmaceutical Association of all moneys received and disbursed by it pursuant to this act. And the State of Nebraska shall in no case be liable for any such compensation or expenses; *And provided further*, That said Board shall have the power to discharge any of said secretaries at any time, and to fill any vacancy in the position of secretary whenever from any cause such vacancy exists.

SEC. 2. The said Board shall, within thirty days after its appointment, meet and organize by the election of a president and secretary from its own members, who shall be elected for the term of one year, and until their successors are elected, and shall perform the duties prescribed by the Board. Said secretary shall, in addition to his compensation as a member of said Board, receive a further sum not to exceed one hundred dollars annually for his services as said secretary. It shall be the duty of the Board to examine all applications for registration submitted in proper form; to grant certificates of registration to such persons as may be entitled to the same under the provisions of this act; to investigate complaints and to cause the prosecution of all persons violating its provisions; to report annually to the Governor and to the Nebraska State Pharmaceutical Association upon the conditions of pharmacy in the State, which said report shall also furnish a record of the proceedings of the said Board for the year, and also the names of all pharmacists registered under this act. The Board shall hold meetings for the examination of applicants for registration, and the transaction of such other business as shall pertain to its duties, at least once in four months, said meetings to be held on the first Tuesdays of March, July, and November in each year; and shall make by laws for the proper fulfillment of its duties under this act; and shall keep a book of registration in which shall be entered the names and places of business of all persons registered under this act, which book shall also specify such facts as said persons shall claim to justify their registration. The record of said Board, or a copy of any part thereof, certified by the secretary to be a true copy, attested by the seal of the Board, shall be accepted as competent evidence in all courts of the State. Three members of said Board shall constitute a quorum.

SEC. 3. Every person who shall, within three months after the passage of this act takes effect, forward to the Board of Pharmacy satisfactory proof, supported by his affidavit, that he was engaged in the business of a dispensing pharmacist on his own account in this State at the time this act takes effect, in the preparation of physicians' prescriptions, or that at such time he had been employed or engaged three years or more as a pharmacist in the compounding of physicians' prescriptions, and was at said time so employed in this State shall, upon payment to the Board of a fee of two dollars ($2), be granted the certificate of Registered Pharmacist; *Provided*, That in case of failure or neglect to register as herein provided, such person or persons shall, in order to be registered, comply with the requirements provided for registration as a licentiate in pharmacy hereinafter described.

SEC. 4. No person other than a licentiate in pharmacy shall be entitled to registration as a pharmacist except as provided in section 3. Licentiates in pharmacy, in the meaning of this act, shall be such persons not less than eighteen years of age, who shall have passed a satisfactory examination touching their competency before the Board of Pharmacy. Every such person shall, before an examination is granted, furnish satisfactory evidence that he is of temperate habits, and pay to the Board a fee of three dollars; *Provided*, That in case of the failure of any applicant to pass a satisfactory examination, the money shall be held to his credit for a second examination at any time within the year. The said Board may grant certificates of registration, without further examination, to the licentiates of such other Boards of Pharmacy as it may deem proper, upon payment of a fee of two dollars ($2).

SEC. 5. The said Board may grant, under such rules and regulations as it may deem proper, for a fee not exceeding one dollar ($1), the certificate of registered assistants to clerks or assistants to pharmacy, not less than eighteen years of age, who at the time this act takes effect shall be engaged in such service in the State, and have been employed or engaged two years or more in the practice of pharmacy, but such certificate shall not entitle the holder to engage in such business on his own account, or to take charge of or act as manager of a pharmacy or drug store.

SEC. 6. Every registered pharmacist, or registered assistant, who desires to continue the practice of his profession, shall annually, after the expiration of the first year of his registration, during the time he shall continue in such practice, on such date as the Board may determine, pay to the said Board a registration fee to be fixed by the Board, but which shall not exceed one dollar ($1) for a pharmacist or fifty cents for an assistant, for which he shall receive a renewal of said registration. Every person receiving a certificate under this act shall keep the same conspicuously exposed in his place of business. Every registered pharmacist or assistant shall, after changing his place of business or employment, as designated by his certificate, notify the secretary of the Board of his new place of business. If any pharmacist or registered assistant shall fail or neglect to procure his annual registration, or to comply with the other provisions of this section, his right to act as such pharmacist or assistant shall cease at the expiration of ten days from the time of notice of such failure to comply with the provisions of this section shall have been mailed to him by the secretary of said Board.

SEC. 7. Any registrations obtained through false representations shall be void, and the Board of Pharmacy may hear complaints and evidence, and may revoke such certificates as it may deem improperly held.

SEC. 8. Any proprietor of a pharmacy who, not being a registered pharmacist, shall, ninety (90) days after this act takes effect, fail or neglect to place in charge of such pharmacy a registered pharmacist, or any such proprietor who shall by himself or any other person permit the compounding or dispensing of prescriptions, or the vending of drugs, medicines, or poisons in his store or place of business, except by or in the presence or in and under the supervision of a registered pharmacist or registered assistant; or any person, not being a registered pharmacist, who shall take charge of or act as manager of such pharmacy or store, or who, not being a registered pharmacist or registered assistant, shall retail, compound, or dispense drugs, poisons, or medicines of any kind, or any person violating any provisions of this act to which no other penalty is herein attached, shall be deemed guilty of a misdemeanor, and for every such offence, upon conviction thereof, shall be punished by a fine of not less than ten or more than one hundred dollars, or shall be imprisoned not less than ten days nor more than ninety days.

SEC. 9. Nothing in this act shall prevent any wholesale or retail dealer in any business from selling any patent or proprietary medicines, nor any resident registered physician from dispensing his own medicines on his own prescriptions.

SEC. 10. No person shall add to or remove from any drug, medicine, chemical, or pharmaceutical preparation, any ingredient or material for the purpose of adulteration or substitution, which shall deteriorate the quality, commercial value, or medical effect, or which shall alter the nature or composition of such drug, medicine, chemical, or pharmaceutical preparation, so that it will not correspond to the recognized tests of identity or purity. Any person who shall thus willfully adulterate or alter, or cause to be adulterated or altered, or shall sell or offer for sale any such drug, medicine, chemical or pharmaceutical preparation, or any person who shall substitute or cause to be substituted one material for another, with the intention to defraud or to deceive the purchaser, shall be guilty of a misdemeanor and be liable to prosecution under this act. If convicted he shall be liable to all the costs of the action, and for the first offense be liable to a fine of not less than ten dollars or more than one hundred dollars, and for each subsequent offense a fine of not less than twenty-five dollars or more than one hundred dollars. On complaint being entered, the Board of Pharmacy is hereby empowered to employ an analyst or chemist, whose duty it shall be to examine into the so-called adulteration, substitution or alteration, and report upon the result of his investigation, and if the said report shall be deemed to justify such action, the Board shall duly cause the prosecution of the offender, as provided in this act.

SEC. 11. All suits for the recovery of the penalties prescribed in this act shall be prosecuted in the name of the state of Nebraska in any court having jurisdiction, and it shall be the duty of the prosecuting attorney of the county where such offense has been committed to prosecute all persons violating the provisions of this act, upon proper complaint being made to them.

SEC. 12. The pharmacist of every house dispensing and compounding medicines, registered under this act, shall be exempt and free from all jury duty in the courts of this State.

SEC. 13. Whereas, there being an emergency, this act shall take effect and be in force from and after its passage.

Signed by the Governor, JOHN M. THAYER.

12:05 p. m., March 24, 1887.

PENNSYLVANIA PHARMACY LAW.

AN ACT TO REGULATE THE PRACTICE OF PHARMACY AND SALE OF POISONS AND TO PREVENT ADULTERATIONS IN DRUGS AND MEDICINAL PREPARATIONS IN THE STATE OF PENNSYLVANIA.

WHEREAS, The safety of the public is endangered by want of care in the sale of poisons, whether to be used as such for legitimate purposes or employed as medicines and dispensed on the prescriptions of physicians;

And Whereas, The ability of physicians to overcome disease depends greatly on their obtaining good and unadulterated drugs and properly prepared medicines;

And Whereas, The persons to whom the preparation and sale of drugs, medicines and poisons properly belong, known as apothecaries, chemists and druggists, or pharmacists, should possess a practical knowledge of the business and science of pharmacy in all its relations; therefore,

SECTION 1. *Be it enacted by the Senate and House of Representatives of the Commonwealth of Pennsysvania in General Assembly met, and it is hereby enacted by the authority of the same*, That hereafter no person whatsoever shall open or carry on as manager in the State of Pennsylvania any retail drug or chemical store, nor engage in the business of compounding or dispensing medicines or prescriptions of physicians or of selling at retail any drugs, chemicals, poisons or medicines, without having obtained a certificate of competency and qualification so to do from the State Pharmaceutical Examining Board, and having been duly registered as herein provided.

SEC. 2. That there shall be established in the State of Pennsylvania a Board to be styled The State Pharmaceutical Examining Board, to consist of five persons, three of whom shall constitute a quorum, who shall be appointed by the Governor from among the most skillful retail apothecaries actually engaged in said business in the State of Pennsylvania, and who must have had ten years' practical experience in the same, one to serve five years, one four years, one three years, one two years, and one one year, in the first instance, and thereafter annually the Governor shall appoint one person to serve as a member of said Board for the term of five years. The said persons so appointed shall be and constitute the said The State Pharmaceutical Examining Board, and shall hold the office for the term for which they were appointed or until their successors are duly appointed and qualified, and shall receive as a compensation for their services five dollars for each day actually engaged in this service, and all legitimate and necessary expenses incurred in attending the meetings of said Board under the provisions of this act; and no part of the salary of said Board or expenses thereof shall be paid out of the State Treasury.

The said Board shall organize by electing one of its members secretary, who in addition to his compensation as a member of said Board shall receive a further sum not to exceed one hundred dollars annually for his services as secretary.

They, the said Board, and each of them, shall within ten days after their appointment, or being apprised of the same, take and subscribe an oath or affirmation before a properly qualified officer of the county in which they reside that they will faithfully and impartially perform the duties of their office.

Any vacancies occurring in said Board shall be filled by the Governor of the State of Pennsylvania from among such only as are eligible for original appointment.

SEC. 3. The said The Pharmaceutical Examining Board shall keep a book of registration open at some convenient place, of which due notice shall be given by advertisement in at least four newspapers in the State, and so divided as to reach as nearly as practicable all parts thereof, in which book shall be registered the name and address of each and every person duly qualified under this act to conduct and carry on the retail drug and apothecary business, or to hold the position of qualified assistant therein. And it shall be the duty of all persons now conducting, or who shall hereafter conduct, the business of retail apothecaries, or those acting in the capacity of qualified assistants therein, in said State, to apply to said Board and be registered as such within ninety days after such notice, and thereafter every three years. Application for registration only may be sent by mail to the secretary of the Examining Board after being properly attested before a notary public or any other person authorized to administer an oath or affirmation in the county in which the applicant resides.

The form of application shall be subject to such regulations as the Board may see proper to adopt, but in no case shall the applicant be put to any unnecessary expense in order to secure registration.

SEC. 4. The said Board shall be entitled to demand and receive from each applicant for examination and registration and for the certificate hereinafter provided a fee not to exceed two dollars, and for registration only a fee not to exceed one dollar in the first instance, and for renewing the same every three years a fee not to exceed one dollar; and the amount derived from this source shall be held by said Board and be applied to the expenses and salaries herein provided and such as may arise under the provisions of this act, and they, the said Board, shall report annually to the Governor of the State of Pennsylvania all moneys received and disbursed under the provisions of this act, together with the number of pharmacists registered under this act.

SEC. 5. That it shall be the duty of said Board to meet at least once every three months in the city of Harrisburg, or at such other place as they may deem expedient, and examine all persons who shall desire to carry on the business of a retail apothecary or that of retailing drugs, chemicals, or poisons, or of compounding physicians' prescriptions, touching their competency and qualifications; and they, the said Board, or a majority of them, shall grant to such persons as shall be qualified certificates of competency or qualification which shall entitle the holders thereof either to conduct or carry on the business, or to act as a qualified assistant therein, as may be expressed upon the said certificate, and such certificate, together with its renewals, shall be good and sufficient evidence of registration under this act.

All persons applying for examination for certificate to entitle them to conduct and carry on the retail drug or apothecary business, must produce satisfactory evidence of having had not less than four years' practical experience in the business. And those applying for examination for certificates as qualified assistants therein, must produce evidence of having had not less than two years' experience in said business.

SEC. 6. That no person shall hereafter engage as manager in the business of an apothecary or pharmacist, or of retailing drugs, chemicals, and poisons, or of compounding and dispensing the prescriptions of physicians, either directly or indirectly, without having obtained such certificate as aforesaid. But nothing contained in this act shall in any manner whatever interfere with the business of any practitioner of medicine, nor prevent him from administering or supplying to his patients such articles as to him may seem fit and proper, nor shall it interfere with the making and dealing in proprietary remedies popularly called patent medicines, nor prevent storekeepers from dealing in and selling the commonly used medicines and poisons, if such medicines and poisons conform in all respects to the requirements of section nine, provided the provisions of section ten of this act be fully complied with.

Any person who shall violate or fail to comply with the provisions of this section shall be guilty of a misdemeanor, and on conviction before any court, shall be punished by a fine not exceeding one hundred dollars, or be imprisoned in the county jail of the proper county for a term not exceeding one year, or either, or both, at the discretion of the court.

SEC. 7. That the foregoing provisions of this act shall not apply to or affect any person who shall be engaged in the retail drug or apothecary business as proprietor of the same, or as qualified assistant therein, at the passage of this act, except only in so far as relates to registration and fees provided in sections three and four of this act.

A qualified assistant engaged in the business at the passage of this act is one who has had not less than two years' practical experience in the retail drug and apothecary business. All other assistants actually engaged in the business at the passage of this act shall, upon the completion of a like term of two years' experience, be entitled to registration as qualified assistants without examination.

SEC. 8. That no person shall be allowed by the proprietor or manager of any store or place where prescriptions are compounded, to compound or dispense the prescriptions of physicians, except under the immediate supervision of said proprietor or his qualified assistant, unless holding a properly certified certificate of registration or competency from the State Pharmaceutical Examining Board as herein provided, and any person violating the provisions of this section shall be deemed guilty of misdemeanor, and on conviction thereof shall be punished by a fine not exceeding one hundred dollars.

SEC. 9. That no person shall knowingly, willfully or fraudulently, falsify, or adulterate, or cause to be falsified or adulterated, any drug or medical substance, or any preparation authorized or recognized by the Pharmacopœia of the United States, or used or intended to be used in medicinal practice, nor mix or cause to be mixed with any such drug or medicinal substance any foreign or inert substance whatsoever for the purpose of destroying or weakening its medicinal power and effect, and willfully, knowingly or fraudulently sell or cause the same to be sold for medicinal purposes.

Any person who shall violate this section shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine not exceeding five hundred dollars, and shall forfeit to the Commonwealth all articles so adulterated.

SEC. 10. POISONS. A poison in the meaning of this act shall be any drug, chemical or preparation which according to standard works on medicine or materia medica is liable to be destructive to adult human life in quantities of sixty grains or less.

No person shall sell at retail any poisons except as herein provided, without affixing to the bottle, box, vessel or package containing the same a label, printed or plainly written, containing the name of the article, the word "poison," and the name and place of business of the seller, nor shall he deliver poison to any person without satisfying himself that such poison is to be used for legitimate purposes.

It shall be the further duty of any one selling or dispensing poisons which are known to be destructive to adult human life in quantities of five grains or less, before delivering them, to enter in a book kept for this purpose the name of the seller, the name and residence of the buyer, the name of the article, quantity sold or disposed of, and the purpose for which it is said to be intended; which book of registry shall be preserved for at least two years, and shall at all times be open to the inspection of the coroner or courts of the county in which the same may be kept.

The provisions of this section shall not apply to the dispensing of physicians' prescriptions specifying poisonous articles, nor to the sale to agriculturists of such articles as are commonly used by them as insecticides. Any person failing to comply with the provisions of this section shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine not less than five, nor more than fifty dollars for each and every offense.

SEC. 11. Any graduate of any accredited medical college who has had not less than three years' continuous practice since the date of his diploma, and who is registered as a practitioner of medicine and surgery under the act entitled "An act to provide for the registration of all practitioners of medicine and surgery," approved the eighth day of June, Anno Domini, one thousand eight hundred and eighty-one, may be registered under this act without examination, and be granted a certificate which shall entitle him to conduct and carry on the retail drug or apothecary business as proprietor or manager thereof, subject to fees provided in sections three and four of this act.

SEC. 12. It shall be the duty of the State Pharmaceutical Examining Board to investigate all complaints and charges of non compliance or violation of the provisions of this act, and prosecute all persons so offending whenever there shall appear to the Board reasonable ground for such action.

SEC. 13. That all acts, and parts of acts, so far as they may be in conflict with this are hereby declared void and of no effect.

For the information of druggists we also append the section of the High License Bill, which is of special interest to them:

SEC. 16. That druggists and apothecaries shall not be required to obtain a license under the provisions of this act, but shall not sell intoxicating liquors except upon the written prescription of a regularly registered physician. Alcohol, however, or any preparation containing the same, may be sold for scientific, mechanical, or medicinal purposes. Any one violating the provisions of this act shall be guilty of a misdemeanor, and upon conviction thereof shall be subject to the same penalties as are provided in the 15th section of this act; provided that no spiritous, vinous, malt, or brewed liquor shall be sold or furnished to any person more than once on any one prescription of a physician, and provided further that any physician who shall wilfully prescribe any intoxicating liquors as a beverage to persons of known intemperate habits shall be guilty of a misdemeanor, and upon conviction thereof shall be subject to the same penalties and fines as are prescribed in section 17.

DAKOTA PHARMACY ACT.

AN ACT TO REGULATE THE PRACTICE OF PHARMACY, THE LICENSING OF PERSONS TO CARRY ON SUCH PRACTICE, AND THE SALE OF POISONS IN THE TERRITORY OF DAKOTA.

1. Forbids compounding or sale of drugs, medicines or poisons, except by registered pharmacists.
2. Who shall register.
3. Who shall be licentiates in pharmacy.
4. Board of Pharmacy; Governor to appoint; Dakota Pharmaceutical Association to nominate candidates for appointment as members.
5. Organization of Board; duties of members and officers; examination meetings; quorum.
6. Requirement of persons claiming registry.
7. This act does not prevent an employe of sufficient experience from becoming a "Registered Pharmacist."
8. Certificate for pharmacists, and fees for same.
10. Annual fees; certificate open for public inspection.
11. Duties of secretary of Board and salary; to be treasurer of Board; bond; disposition of funds.
12. Requires compliance with the provisions of this act within ninety days; penalty for failure to comply; exceptions.
13. Forbids adulteration of drugs; penalty for same; Board to prosecute violations of this act.

14. All poisons to be labeled.
15. Prosecution of suits; duty of county attorneys; disposition of penalties collected.
16. All other acts repealed; forfeited membership.
17. Exempt from jury duty.
18. In force.

Be it enacted by the Legislative Assembly of the Territory of Dakota:

SECTION 1. That it shall hereafter be unlawful for any person, other than a registered pharmacist, to retail, compound, or dispense drugs, medicines or poisons, or to institute or conduct any pharmacy, store or shop for retailing, compounding or dispensing drugs, medicines or poisons, unless such person shall be a registered pharmacist, or shall employ and place in charge of said pharmacy, store or shop, a registered pharmacist, within the full meaning of this act, except as hereinafter provided.

SEC. 2. In order to be registered within the full meaning of this act, all persons must either be graduates in pharmacy, or shall at the time this act takes effect be engaged in the business of a dispensing pharmacist on their own account, in the Territory of Dakota, or who shall have been engaged in the dispensing of drugs and medicines for a period of not less than ten years in the preparation of physicians' prescriptions, and in the vending and compounding of drugs, medicines and poisons, or shall be licentiates in pharmacy.

SEC. 3. Licentiates in pharmacy shall be such persons as have had two successive years' practical experience in drug stores wherein the prescriptions of medical practitioners are compounded, and have sustained a satisfactory examination before one or either of the Territorial Boards of Pharmacy hereinafter mentioned. Such Boards of Pharmacy may grant certificates of registration to graduates in pharmacy who have obtained a diploma from such colleges or schools of pharmacy as shall be approved by said Board, or to licentiates of such other State or Territorial Boards as it may deem proper, without further examination.

SEC. 4. Immediately upon the passage of this act the Dakota Pharmaceutical Association, and Southern District Pharmaceutical Association, shall select each five reputable and practicing pharmacists doing business in their respective districts, from which number the Governor of the Territory shall appoint three of each five. The said three pharmacists, duly elected and appointed, shall constitute the Board of Pharmacy of the districts of North and South Dakota respectively, and shall hold office as respectively designated in the appointments, for the term of one, two and three years, as hereinafter provided, and until their successors have been appointed and qualified. The Dakota Pharmaceutical Association, and Southern District Pharmaceutical Association, shall each annually thereafter select three pharmacists who shall be members in good standing, from which number the Governor of the Territory shall appoint one to fill the vacancy annually occurring in said Boards. The term of office shall be for three years. In case of resignation or removal from the district of any member of said Boards, or of a vacancy occurring from any cause, the Governor shall fill the vacancy by appointing a pharmacist from the names last submitted, to serve as a member of the Board for the remainder of the term; provided, all that part of Dakota lying south of the seventh standard parallel shall be held to constitute one Pharmaceutical District, and all that part lying north of the same line shall constitute one Pharmaceutical District.

SEC. 5. Said Boards shall, within thirty (30) days after their appointment, meet and organize by the selection of a president and secretary from the number of its own members, who shall be elected for a term of one year, and shall perform the duties prescribed by the Board. It shall be the duty of the Board to examine all applications for registration, within their respective districts, submitted in proper form; to grant certificates of registration to such persons as may be entitled to the same under the provisions of this act; to cause the prosecution of all persons violating its provisions; to report annually to the Governor and to their respective Pharmaceutical Association, upon the condition of pharmacy in the Territory, which said report shall also furnish a record of the proceedings of the said Board for the year, as well as the names of all pharmacists duly registered under this act. The Board shall hold meetings for the examination of applicants for registration and transaction of such other business as shall pertain to its duties, at least twice or not more than four times a year, at discretion of Board, and the said Board shall give thirty (30) days' public notice of the time and place of such meeting. The said Board shall also have power to make by-laws for the proper execution of its duties under this act, and shall keep a book of registration, in which shall be entered the names and places of business of all persons registered under this act, which registration book shall also contain such facts as such persons claim to justify their registration. Two members of said Board shall constitute a quorum.

SEC. 6. Every person claiming the right of registration under this act, who shall, within three months after the passage of this act and organization of this Board, forward to the Board of Pharmacy satisfactory proof, supported by his affidavit, that he was engaged in the business of dispensing pharmacist on his own account in the Territory of Dakota, at the time of the passage of this act as provided in section 2, shall, upon the payment of the fee hereinafter mentioned, be granted a certificate of registration; provided, that in case of failure or neglect to register as herein specified, then such person shall, in order to be registered, comply with the requirements provided for registration as licentiates in pharmacy within the meaning of this act.

SEC. 7. That the foregoing provisions of this act shall not apply to, or affect any person having five (5) consecutive years' experience in the dispensing of and compounding of the prescriptions of regular practitioners, and employed as a pharmacist in Dakota at the passage of this act, only in so far as relates to registration and fees hereinafter provided for.

SEC. 8. Every person claiming registration as a registered pharmacist under section 6 of this act shall, before a certificate is granted, pay to the secretary of the Territorial Board of Pharmacy the sum of two dollars, and a like sum shall be paid to said secretary by such licentiates of other Boards who shall apply for registration under this act; and every applicant for registration by examination shall pay to the said secretary the sum of five dollars before such examination be attempted; provided, that in case of failure to pass a satisfactory examination, he may be re-examined at any regular meeting of the Board by paying a fee of three dollars.

SEC. 9. Any assistant or clerk in pharmacy, who shall not have the qualifications of a registered pharmacist within the meaning of this act, not less than eighteen years of age, who, at the time this act takes effect, shall have been employed or engaged two years or more in drug stores, where the prescriptions of medical practitioners are compounded, and shall furnish satisfactory evidence to that effect to the Territorial Board of Pharmacy shall, upon making application for registration and upon payment to the secretary of said Boards of a fee of one dollar, within sixty (60) days after this act takes effect, be entitled to a certificate as a "registered assistant," which said certificate shall entitle him to continue in such duties as clerk or assistant, but such certificate shall nct entitle him to engage in business on his own account unless he shall have had at least four years' experience in pharmacy at the time of the passage of this act. Annually thereafter, during the time he shall continue in such duties, he shall pay to said secretary a sum not exceeding fifty cents, for which he shall receive a renewal of this certificate.

SEC. 10. Every registered pharmacist, who desires to continue the practice of his profession, shall annually, during the time he shall continue such practice, on such date as the Board of Pharmacy may determine, pay to the secretary of said Board a registration fee, the amount of which shall be fixed by the Board, and which in no case shall exceed two dollars, in return for which payment he shall receive a renewal of said registration. Every certificate of registration and every renewal of such certificate shall be conspicuously exposed in the pharmacy to which it applies.

SEC. 11. The secretary of each Board of Pharmacy shall receive a salary which shall be determined by said Board; he shall also receive his traveling and other expenses incurred in the performance of his official duties. The other members of said Board shall receive the sum of five dollars for each day actually engaged in such service, and all the legitimate and necessary expenses incurred in attending the meetings of said Boards. Said expenses shall be paid from the fees and penalties received by said Board under the provisions of this act, and no part of the salary or other expenses of said Board shall be paid out of the public treasury. All moneys received by said Board, in excess of said allowances and other expenses hereinbefore provided for, shall be held by the secretary of said Board as a special fund for meeting the expenses of said Board; said secretary giving such bonds as the said Board shall from time to time direct and approve. The said Board shall, in its annual report to the Governor and to the Dakota Pharmaceutical Association, render an account of all moneys received and disbursed by them pursuant to this act.

SEC. 12. Any person not being or not having in his employ a registered pharmacist, within the full meaning of this act, who shall, after the expiration of ninety (90) days from the passage of this act and organization of said Board, retail, compound, or dispense medicines, or who shall take, use or exhibit the title of a registered pharmacist, shall for each and every such offense be liable to a penalty not to exceed fifty dollars. Any registered pharmacist or other person who shall permit the compounding and dispensing of prescriptions, or the vending of drugs, medicines or poisons in his store or place of business, except under the supervision of a registered pharmacist, or any pharmacist, who, while continuing in business, shall fail or neglect to procure his annual registration, or any person who shall wilfully make any false representation to procure registration for himself or any other person, or who shall violate any other provision of this act, shall for each and every such offense be liable to a penalty not to exceed fifty dollars; provided, that nothing in this act shall in any manner interfere with the business of any physician in regular practice, or prevent him from supplying his patients such articles as may seem to him proper, nor with the making of proprietary medicine, or medicines placed in sealed packages with the name of the contents and of the pharmacist or physician by whom prepared or compounded, nor prevent shopkeepers from dealing in and selling the commonly used medicines and poisons if such medicines and poisons are put up by a registered pharmacist, or from dealing in and selling of patent or proprietary medicines, nor with the exclusive wholesale business of any dealers except as hereinbefore provided.

SEC. 13. Every proprietor or conductor of a drug store shall be held responsible for the quality of all drugs, chemicals and medicines sold or dispensed by him, except those sold in the original package of the manufacturer, and except those articles or preparations known as patent or proprietary medicines. Any person who shall knowingly, wilfully or fraudulently falsify or adulterate, or cause to be falsified or adulterated, any drug or medicinal substance, or any preparation authorized or recognized by any standard work on pharmacy, or used or intended to be used in medical practice, or shall mix or cause to be mixed with any such drug or medicinal substance, any foreign or inert substance whatsoever, for the purpose of destroying or weakening its medicinal power and effect, or of lessening its cost, and shall wilfully, knowingly or fraudulently sell, or cause the same to be sold for medicinal purposes, shall be deemed guilty of a misdemeanor, and upon conviction thereof, shall pay a penalty not exceeding five hundred dollars, and shall forfeit to the Territory of Dakota all articles so adulterated.

SEC. 14. POISON. ' A poison, in the meaning of this act, shall be any drug, chemical or preparation which, according to standard works on medicine, or materia medica, is liable to be destructive to adult human life, in quantities of sixty (60) grains or less. No person shall sell at retail any poisons, except as herein provided, without affixing to the bottle, box, vessel or package containing the name of the article, the word "Poison," and the name and place of business of the seller, nor shall he deliver poison to any person without satisfying himself that such poison is to be used for legitimate purposes; provided, that nothing herein contained shall apply to the dispensing of physicians' prescriptions specifying poison. It shall also be the duty of such vendor of poisons before delivering the same to the purchaser, to cause an entry to be made in a book kept for that purpose, stating the date of sale, the name and address of the purchaser, the name and quality of the poison sold, and the name of the dispenser, such book to be always open for inspection by the proper authorities, and to be preserved for reference for at least five years. Any person failing to comply with the requirements of this section shall be deemed guilty of a misdemeanor, and shall be liable to a fine of not less than five (5) dollars for each and every such omission.

SEC. 15. All suits for the recovery of the several penalties and costs prescribed in this act, shall be prosecuted in the name of the Territory of Dakota, in any court having jurisdiction, and it shall be the duty of the district attorney of the county wherein such offense is committed, to prosecute all persons violating the provisions of this act, upon proper complaint being made. All penalties collected under the provisions of this act shall inure to the Board of Pharmacy, for the expenses and costs of the proper execution of the law.

SEC. 16. All acts or parts of acts regulating the practice of pharmacy, or the adulteration of drugs, within this Territory, enacted prior to the passage of this act, which in any way conflict with the provisions of this act, are hereby repealed; provided, that nothing in this act shall be so construed as to prevent any person who has once been a registered member by examination and may have forfeited his membership by non-payment of fines or fees, from renewing his membership within two years, by paying the required dues or fees, without examination.

SEC. 17. This act shall take effect and be in force from and after its passage and approval.

UNITED STATES OF AMERICA, } Secretary's Office.
TERRITORY OF DAKOTA.

I, M. L. McCormack, Secretary of the Territory of Dakota, do hereby certify that I have carefully compared the foregoing copy of An Act to Regulate the Practice of Pharmacy, the Licensing of Persons to Carry on Such Practice, and the Sale of Poisons in the Territory of Dakota, with the enrolled act now on file in this office, and that the same is a correct transcript therefrom and of the whole thereof.

In testimony whereof, I have hereunto set my hand and affixed the great seal of the Territory of Dakota, at Bismarck, this 17th day of March, 1887.

M. L. McCORMACK,
Secretary of Dakota Territory.

IDAHO PHAMACY LAW.

PRACTICE OF PHARMACY.

SECTION. 1292. Compensation of Board. Disposition of moneys. Bond of Secretary. Report.
" 1293. Trading without registration. Permitting unregistered persons to sell. Failure to renew registration. Penalty. Physician. Proprietary medicines.
" 1294. Adulteration of drugs. Penalty.
" 1295. Poisons must be marked and record kept.
" 1296. Prosecutions under this chapter.
" 1297. Repealing clause.

SECTION 1282 (SEC. 1). It shall hereafter be unlawful for any person other than a registered Phamacist, to retail, compound or dispense drugs, medicines or poisons, or to institute or conduct any pharmacy, store or shop for retailing, compounding or dispensing drugs, medicines or poisons, unless such person shall be a registered pharmacist or shall employ and place in charge of said pharmacy or store a registered pharmacist within the full meaning of this act, as hereinafter provided.

SEC. 1283 (SEC. 2). In order to be registered within the full meaning of this act, all persons must be either graduates in pharmacy, or shall at the time this act takes effect be engaged in the business of a dispensing pharmacist on their own account, in the Territory of Idaho, in the preparation of physicians' prescriptions, and in the vending and compounding of drugs, medicines, and poisons, or shall be licentiates of pharmacy.

SEC. 1284 (SEC. 3). Graduates in pharmacy shall be considered to consist of such persons as have had four years' practical experience in drug stores where prescriptions of medical practitioners are compounded, or have obtained a diploma from such colleges or schools of pharmacy as shall be approved by the Board of Pharmacy. Such shall be judged by the said Board of Pharmacy as sufficient guarantee of their attainments and proficiency.

SEC. 1285 (SEC. 4). Licentiates in pharmacy shall be such persons as have had two years' practical experience in drug stores wherein the prescriptions of medical practitioners are compounded, and have sustained a satisfactory examination before such Board of Pharmacy hereinafter mentioned. The said Board of Pharmacy may grant certificates of registration to licentiates of such other State Boards as it may deem proper, without further examination. It shall be the duty of the Board to grant in towns or villages of less than five hundred inhabitants, a minor certificate to such persons as they may deem competent to sell or vend such medicines and compounds as are required by the general public, but such parties shall not be considered competent unless they have had two years' experience in the sale of such medicines and compounds. The said certificate shall entitle the holder thereof only to registration as assistant pharmacist in towns and villages of (not) over five hundred inhabitants.

SEC. 1286 (SEC. 5). The County Commissioners of each county in the Territory of Idaho, at their first meeting after the passage of this act, shall appoint three reputable and practicing pharmacists or physicians of such county, *provided*, there be the required three members residing therein; if not, then they shall select so many as may be required to fill said Board from the nearest and most convenient adjoining county, who shall constitute the Board of Pharmacy of such county, and shall hold office as respectively designated in their appointments, for the term of one, two and three years respectively as hereinafter provided, and until their successors shall have been duly appointed. The County Commissioners shall annually thereafter appoint one pharmacist or physician to fill the vacancy annually occurring in said Board. The term of office shall be three years. In case of the resignation or removal from the county of any member of said Board, or of a vacancy occurring from any cause, the County Commissioners shall fill the vacancy by appointing some reputable pharmacist or physician to serve as member of the Board for the remainder of the term.

SEC. 1287 (SEC. 6).—The said Board shall within thirty days of its appointment meet and organize by the selection of a chairman and secretary from the number of its own members, who shall serve for the term of one year, and shall perform the duties prescribed by the Board. It shall be the duty of the Board to examine all applications for registration submitted in proper form; to grant certificates of registration to such persons as may be entitled to the same, under the provisions of this act; to cause the prosecution of all persons violating its provisions; to report annually to the County Commissioners; said report shall furnish a record of the proceedings of the said Board for the year, as well as the names of all pharmacists duly registered under this act. The Board shall hold meetings for the examination of applicants for registration and the transaction of such other business as shall pertain to its duties, at least once in six months, and the said Board shall give thirty days' notice of the time and place of such meeting. The said Board shall keep a book of registration, in which shall be entered the names and places of business of all persons registered under this act, which registration book shall also contain such facts as said persons shall claim to justify their registration.

SEC. 1288 (SEC. 7). Every person claiming the right of registration under this act, who shall within three months after the passage of this act, forward to the Board of Pharmacy satisfactory proof, supported by his affidavit, that he was engaged in the business of dispensing pharmacist on his own account, in said county, at the time of the passage of this act, as provided in section 2, shall upon the payment of the fee hereinafter mentioned, be granted a certificate of registration. Provided, That in case of failure or neglect to register as herein specified, then such person shall, in order to be registered, comply with the requirements provided for registration as graduates in pharmacy, or licentiates in pharmacy, within the meaning of this act.

SEC. 1289 (SEC. 8). Any person engaged in the position of assistant or clerk in pharmacy at the time this act takes effect, not less than eighteen years of age, who shall have had at least two years' experience in drug stores where the prescriptions of medical practitioners are compounded, and who shall furnish satisfactory evidence to that effect to the Board of Pharmacy, shall upon making application for registration, and upon payment to the secretary of said Board a fee of one dollar, within sixty days after this act takes effect, be entitled to a certificate as "registered assistant," which certificate shall entitle him to continue in such duties as clerk or assistant, but such certificate shall not entitle him to engage in business on his own account, except as provided for in section 4, or to the certificate of registered pharmacist, unless he shall have had at least four years' experience in such stores where the prescriptions of medical practitioners are compounded, at the time of the passage of this act. Thereafter he shall pay annually to the said secretary the sum of one dollar during the time he shall continue in such duties, in return for which sum he shall receive a renewal of his certificate.

SEC. 1290 (SEC. 9). Every person claiming registration as a registered pharmacist under section 7 of this act shall, before a certificate is granted, pay to the secretary of said Board of Pharmacy the sum of five dollars, and a like sum shall be paid to said secretary by graduates in pharmacy, and by such licentiates of other Boards who shall apply for registration under this act, and every applicant for registration by examination shall pay to the said secretary the sum of ten dollars before such examination be attempted.

SEC. 1291 (SEC. 10). Every registered pharmacist who desires to continue the practice of his profession shall annually, during the time he shall continue in such practice, on such date as the Board of Pharmacy may determine, pay to the secretary of such Board a registration fee, the amount of which shall be fixed by the Board, and which in no case shall exceed five dollars, in return for which payment he shall receive a renewal of said registration. Every certificate of registration, and every renewal of such certificate, shall be conspicuously exposed in the pharmacy to which it applies.

SEC. 1292 (SEC. 11). Each member of such Board of Pharmacy shall receive the sum of three dollars per day for each day actually engaged in such service, and all legitimate and necessary expenses incurred in attending the meetings of such Board; said expenses shall be paid from the fees and penalties received by said Board under this act, and no part of the salary or other expenses of said Board shall be paid out of the public treasury. All moneys received by said Board in excess of said allowance and other expenses hereinbefore provided for shall be held by the secretary of said Board as a special fund for meeting the expenses of said Board, said secretary giving such bonds as the said Board shall from time to time direct. The said Board shall in its annual report to the County Commissioners render an account of all moneys received and disbursed by them pursuant to this act.

SEC. 1293 (SEC. 12). Any person not being or not having in his employ a registered pharmacist within the full meaning of this act, except as provided in section 4, who shall after the expiration of ninety days from the passage of this act, keep a pharmacy store or shop for retailing, compounding or dispensing medicines, or who shall take, use or exhibit the title of a registered pharmacist, shall for each and every such offense be liable to a penalty of fifty dollars. Any registered pharmacist or other person who shall permit the compounding or dispensing of prescriptions, or the vending of drugs, medicines or poisons in his store or place of business, except under the supervision of a registered pharmacist, or except by a registered assistant pharmacist, or any pharmacist or registered assistant who, while continuing in business, shall fail or neglect to procure his annual registration, or any person who shall wilfully make any false representation to procure registration for himself or other person, or who shall violate any of the provisions of this act, shall for each and every such offense be liable to a penalty of fifty dollars. Provided, That nothing in this act shall in any manner interfere with the business of a physician in regular practice, or prevent him from supplying to his patients such articles as may seem to him proper, nor with the making and vending of proprietary medicines, or medicines placed in sealed packages, with the name of the contents, and of the pharmacist or physician by whom prepared or compounded, nor with the sale of the usual domestic remedies by retail dealers, nor with the exclusively wholesale business of any dealers except as hereinafter provided.

SEC. 1294 (SEC. 13). Every proprietor or conductor of a drug store shall be held responsible for the quality of all drugs, chemicals and medicines sold by him, except those sold in the original packages of the manufacturers, and except those articles or preparations known as patent or proprietary medicines; and should such proprietor or conductor of a drug store, knowingly, intentionally, or fraudulently, adulterate, or cause to be adulterated, such drugs, chemicals, or medical preparations, he shall be deemed guilty of a misdemeanor, and upon conviction, shall be liable to a penalty of not less than fifty dollars nor more than two hundred dollars, and his name stricken from the register.

SEC. 1295 (SEC. 14). No person shall sell or retail any poisons commonly recognized as such, and especially aconite, arsenic, belladonna, biniodide of mercury, carbolic acid, chloral hydrate, chloroform, conium, corrosive sublimate, creosote, croton oil, cyanide of potassium, digitalis, hydrocyanic acid, laudanum, morphine, nux vomica, oil of bitter almonds, opium, oxalic acid, strychnine, sugar of lead, sulphate of zinc, white precipitate, red precipitate, or cocaine, without affixing to the bottle, box or package containing the same, and to the wrapper or cover thereof, a label bearing the name "poison" distinctly shown, together with the name and place of the seller; *Provided*, That nothing herein contained shall apply to physicians' prescriptions specifying any of the poisons aforesaid. For his own protection the pharmacist shall be required to keep a book, to be known as a poison register, in which he shall be required to keep a record of the kind of poison sold, the amount sold, for what purpose sold, accompanied with the signature of the purchaser. Any person failing to comply with the requirements of this section shall be deemed guilty of a misdemeanor, and shall be liable to a fine of not less than five dollars for each and every such offense.

SEC. 1296 (SEC. 15). All suits for the recovery of the several penalties prescribed in this act shall be prosecuted in the name of the people of the Territory of Idaho, in any court having jurisdiction, and it shall be the duty of the district attorney of the county wherein such offense is committed to prosecute all persons violating the provisions of this act, upon proper complaint being made. All penalties collected under the provisions of this act shall inure one-half to the Board of Pharmacy, and the remainder to the school fund of the county in which the suit was prosecuted and judgment obtained.

SEC. 1297 (SEC. 16). All acts or parts of acts regulating the practice of pharmacy and the sale of poisons within this Territory, enacted prior to the passage of this act, are hereby repealed.

(Act Feb. 7, 1887. In effect immediately.)

WYOMING PHARMACY LAW.

AN ACT TO REGULATE THE PRACTICE OF PHARMACY AND THE SALE OF MEDICINES AND POISONS.

Be it enacted by the Council and House of Representatives of the Territory of Wyoming:

SECTION 1. That from and after the passage of this act it shall be unlawful for any person, not a registered pharmacist within the meaning of this act, to conduct any pharmacy, drug store, apothecary shop or store for the purpose of retailing, compounding or dispensing medicines or poisons, except as hereinafter provided.

SEC. 2. That it shall be unlawful for the proprietor of any store or pharmacy to allow any person except a registered pharmacist to compound or dispense the prescriptions of physicians, or to retail or dispense poisons, except as an aid to and under the supervision of a registered pharmacist.

SEC. 3. The Governor, with the advice and consent of the Territorial Council, shall appoint three persons from among the registered pharmacists of the Territory, representing the different portions of the Territory as nearly as practicable, all of whom shall have been residents of the Territory for two years, and of at least five years' practical experience in their profession, who shall be known and styled as Commissioners of Pharmacy for the Territory of Wyoming; each Commissioner, so appointed, shall hold his office for two years, and until a successor be appointed and qualified. If a vacancy occur in said Commission, another shall be appointed, as aforesaid, to fill the unexpired term thereof. Said Commissioners shall have power to make by-laws and all necessary regulations, and prescribe a course of study for apprentices or students who may be desirous of entering upon the study of the profession of pharmacy, for the proper fulfillment of their duties under this act, without expense to the Territory.

SEC. 4. The Commissioners of Pharmacy shall register in a suitable book, a duplicate of which is to be kept in the office of the Secretary of the Territory, the names and places of residence of all persons to whom they issue certificates and the dates thereof. It shall be the duty of said Commissioners of Pharmacy to register, without examination, as registered pharmacists, all pharmacists and druggists who are engaged in business in the Territory of Wyoming at the passage of this act, if they have had three years' experience as owners or principals of stores or pharmacies for selling at retail, compounding, or dispensing drugs, medicines, or chemicals for medicinal use, or for compounding and dispensing physicians' prescriptions; and all assistant pharmacists, eighteen years of age, engaged in said stores or pharmacies in the Territory of Wyoming at the passage of this act, and who may have been engaged as such by some store or pharmacy where physicians' prescriptions were compounded and dispensed for not less than three years prior to the passage of this act; *Provided, however*, they shall pass a satisfactory examination as provided for candidates by the Commissioners of Pharmacy of the Territory, and that in case of failure or neglect on the part of any such person or persons to apply for registration within sixty days after they shall have been notified, they shall undergo an examination such as is provided for in section five of this act.

SEC. 5. The said Commissioners of Pharmacy shall, upon application, and at such time and place and in such manner as they may determine, examine either by written examination or orally, each and every person who shall desire to conduct the business of selling at retail, compounding, or dispensing drugs, medicines, or chemicals for medicinal use, or compounding and dispensing physicians' prescriptions as pharmacists, and if a majority of said Commissioners shall be satisfied that said person is competent and fully qualified to conduct said business of compounding or dispensing drugs, medicines, or chemicals for medicinal use, or to compound and dispense physicians' prescriptions, they shall enter the name of such person as a registered pharmacist in the book provided for in section four of this act; and every graduate in pharmacy, having a diploma from an incorporated college or school of pharmacy that requires a practical experience in pharmacy of not less than four years before granting a diploma, shall be entitled to have his or her name entered as a registered pharmacist by said Commissioners without examination.

SEC. 6. The Commissioners of Pharmacy shall be entitled to demand and receive from each person whom they register and furnish a certificate as a registered pharmacist, without examination, the sum of three dollars; and from each and every person whom they examine the sum of ten dollars, which shall be in full, for all services. And in case the examination shall prove defective and unsatisfactory, and his name not be registered, he shall be permitted to present himself for re-examination within any period not exceeding twelve months next thereafter, and no charge shall be made for such re-examination.

SEC. 7. Every registered pharmacist shall be held responsible for the quality of all drugs, chemicals and medicines he may sell or dispense, with the exception of those sold in the original packages of the manufacturer and those known as "patent medicines;" and should he knowingly, intentionally and fraudulently adulterate, or cause to be adulterated, such drugs, chemicals or medical preparations, he shall be deemed guilty of a misdemeanor, and upon conviction thereof be liable to a penalty not exceeding one hundred dollars, and in addition thereto his name be stricken from the register.

SEC. 8. It shall be unlawful for any person to sell, barter or give away any poisons without distinctly labelling the bottle, box or package in which it is contained with the name of the article, the word poison, and a vignette representing a skull and crossbones; and the name and place of business of the seller. The purchaser must be made aware of the poisonous nature of the article, and shall represent that it is to be used for a legitimate purpose. The seller shall also enter in a book kept for that purpose the date of sale, name of purchaser, name and quality of the poison, and for what purpose it was purchased.

This provision shall not apply to the dispensing of poisons in usual doses, nor to physicians' prescriptions.

SEC. 9. Any person, not a registered pharmacist, as provided for in this Act, who shall conduct a store, pharmacy, or place for retailing, compounding or dispensing drugs, medicines or chemicals for medicinal use, or for compounding and dispensing physicians' prescriptions, or shall take, use or exhibit the title of registered pharmacist, shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be liable to a penalty of not less than twenty-five dollars nor more than one hundred dollars.

SEC. 10. This act shall not apply to physicians putting up their own prescriptions, nor to the sale of proprietary medicines.

Sec. 11. All acts and parts of acts in conflict with this act are hereby repealed.

Sec. 12. This act shall take effect and be in force from and after its passage.

ILLINOIS PHARMACY LAW: AMENDMENTS.

An Act to amend section seven of an act entitled "An act to regulate the practice of pharmacy in the state of Illinois."

Section 1. *Be it enacted by the People of the State of Illinois, represented in the General Assembly*, That section seven (7) of an act entitled "An act to regulate the practice of pharmacy in the State of Illinois," approved May 30, 1881, in force July 1, 1881, be, and the same is hereby, amended so as to read as follows:

"Sec. 7. Licentiates in pharmacy shall, at the time of passing their examination, be registered by the Secretary of the State Board of Pharmacy as registered pharmacists. Registered assistant pharmacists holding valid certificates as such may become registered as registered pharmacists upon making application to the Board of Pharmacy and paying a fee of two dollars therefor. No person shall hereafter be registered as a registered pharmacist except registered assistant pharmacists and registered pharmacists holding valid certificates as such, in force at the time this amendment takes effect, and licentiates in pharmacy.

KANSAS PHARMACY LAW: AMENDMENTS.

Chapter 174.

[*First Published March 12th, 1887.*]

An Act amendatory of and supplemental to chapter 150 of the session laws of 1885, being an act to prevent incompetent or unauthorized persons from engaging in the practice of pharmacy; also to regulate the sale of poisons and proprietary medicines; to prevent and punish the adulteration of drugs, medicines, medical preparations and chemicals, and to create a board of pharmacy in the state of Kansas, and repeal the original sections 2, 4, 5, 6, 9 and 12 of said chapter.

Be it enacted by the Legislature of the State of Kansas:

Section 1. That section 2 of chapter 150 of the session laws of 1885 be and the same is hereby amended so as to read as follows: Section 2. Immediately upon the passage of this act the governor shall appoint five reputable and practicing pharmacists, doing business in the state of Kansas. Said pharmacists so appointed shall constitute the Board of Pharmacy of the State of Kansas, and shall hold office as respectively designated in their appointments—two for the term of one year, two for the term of two years, and one for the term of three years, respectively as hereinafter provided, and until their successors have been duly appointed and qualified. The Kansas State Pharmaceutical Association shall annually nominate and certify to the governor the names of ten registered pharmacists, residents of the state of Kansas, and who are at that time actually engaged in the business of pharmacy, and have had ten years' practical experience in dispensing physicians' prescriptions, from which list the governor shall annually appoint one or more pharmacists to fill the vacancy annually occurring in said Board. The term of office in said Board shall be three years. In case of death, resignation or removal from the state, of any member of the said Board, or from a vacancy occurring from any cause, the governor shall fill the vacancy by appointing a registered pharmacist from the list last certified to him, to serve as a member of the Board for the remainder of the term. It shall be the duty of the members of this Board, after the receipt of notification of their appointment, to make and subscribe to an oath, properly and faithfully to discharge the duties of their office, and within thirty days thereafter meet and organize by the election of a President, Secretary, and Treasurer, to be selected from the members of the Board.

SEC. 2. That section five of the act of 1885, to which this act is amendatory, shall read as follows: Section 5. Any person desiring to become a registered pharmacist under the provisions of this act shall within ninety days after this act shall take effect forward to said Board his affidavit, properly sworn to before the clerk of the district court of the county where such person proposes to engage in the business, showing that such applicant was at the time of the taking effect of this act, and ever since has been engaged in the business of preparing and dispensing medicines and physicians' prescriptions within the state of Kansas, and that he has had five years' experience in such business, two years of which experience shall have been in the state of Kansas as a clerk or proprietor, and such affidavit shall be accompanied with the clerk's certificate, showing that he is acquainted with the applicant and knows him to be a person of good moral character and worthy of belief. And such applicant shall in addition to such affidavit and certificate, present to said Board the affidavit of two creditable witnesses substantiating in each material particular the affidavit of such applicant, and in addition thereto, showing that such applicant is not in the habit of using intoxicants as a beverage, which affidavit shall show the age, residence and occupation of such witnesses. The Board of Pharmacy, if satisfied with such proof, shall upon the presentation of such proof and upon receipt of a fee of two dollars, register such applicant as a registered pharmacist, and shall thereupon issue to such applicant a certificate of registration, which certificate shall constantly be exposed conspicuously in the pharmacy to which it applies. Persons not availing themselves of the provisions of this section within the time specified may appear before said Board for examination as provided by law. The Board may register as registered pharmacists, without examination, graduates of recognized schools of pharmacy: *Provided*, Said Board shall be satisfied with the moral fitness and sobriety of such graduate: *And provided further*, That all persons holding certificates by examination as registered pharmacists issued within two years prior to the taking effect of this act, shall be entitled to registration under this act, and at the end of sixty days after the taking effect of this act, any certificate issued before this act took effect shall be no longer of any validity.

SEC. 3. That section nine of the act of which this is amendatory shall be and the same is hereby amended so as to read as follows: Section 9. Said Board of Pharmacy shall meet at least once in three months in at least four different parts of the State in each year, to perform the duties required by this act. The members of the Board shall receive the sum of three dollars for each day engaged, together with actual traveling expenses, in the performance of the duties required of them by law, except the secretary, who shall receive the sum of six hundred dollars per year, together with all necessary traveling expenses, all to be paid from the treasury of the Kansas Board of Pharmacy. All fees collected under the provisions of this act shall be paid over at once to the treasurer of said Board, and there to be held in trust for the payment of the expenses of said Board. And the treasurer of said Board shall give such bond from time to time as the Board may direct.

SEC. 4. That section 12 of said act to which this is amendatory be and the same is hereby amended so as to read as follows: Section 12. Pharmacists registered as herein provided shall have the right to keep and sell under such restrictions as herein provided all medicines and poisons authorized by the National, American or United States Dispensatory Pharmacopœia as of recognized medicinal utility: *Provided*, That nothing herein contained shall be construed so as to shield any apothecary or pharmacist who violates or in anywise abuses this trust for the legitimate and actual necessities of medicines, from the utmost rigor of the law relating to the sale of intoxicating liquors, and upon conviction of any violation of the prohibitory liquor law, his name shall be stricken from the register. It shall be unlawful for any person, on and after the passage of this act, to retail any articles enumerated in schedules A, B, C, except as follows:

SCHEDULE A.

Arsenic and its preparations, corrosive sublimate, white precipitate, red precipitate, biniodide of mercury, cyanide of potassium, hydrocyanic acid, chloroform, strychnine, morphine, and all other poisonous vegetable alkaloids and their salts, essential oil of bitter almonds, opium and its preparations, except paregoric and other preparations of opium containing less than two grains to the ounce.

SCHEDULE B.

Aconite, belladonna, colchicum, conium, nux vomica, henbane, cantharides, creosote, digitalis, and their pharmaceutical preparations, croton oil, chloral hydrate, sulphate of zinc, sugar of lead, mineral acids, carbolic acid, oxalic acid, and all other virulent poisons.

SCHEDULE C.

Oil of savin, oil of tansy, ergot and its preparations, cotton root and its preparations, and all other active emmenagogues or abortives. Articles enumerated in schedules A and B shall not be sold without distinctly labeling the box, vessel, or paper in which the said poison is contained, and also the outside wrapper or cover, with the name of the article, the word "poison," and the name and place of business of the seller. Nor shall it be lawful for any person to sell or deliver any poison enumerated in schedules A and B, unless upon due inquiry it be found that the purchaser is aware of its poisonous character, and represents that it is to be used for a legitimate purpose; nor shall it be lawful for any proprietor or owner of any drug store or pharmacy, or any registered pharmacist, to sell or deliver any articles included in the schedules A and B without before delivering the same to the purchaser causing an entry to be made in a book kept for that purpose, stating the date of sale, the article sold, the quantity thereof, the purpose for which it is represented by the purchaser to be required, the name of the dispenser, and the name and address of the purchaser, signed by himself; such book to be always open for inspection by the proper authorities, and to be preserved for at least five years. No articles enumerated in schedule C shall be sold except on the prescription of a legally qualified physician. The provisions of this section shall not apply to the sales of poisons to practicing physicians and photographers, and to the dispensing of poison in not unusual doses or quantities upon the prescriptions of licensed practitioners of medicine. All prescriptions of practicing physicians shall be retained by the dispenser. Any person procuring from any pharmacist articles enumerated in schedules A, B, and C, under fraudulent representations, shall be deemed guilty of a misdemeanor, and be liable to a fine of not less than twenty five nor more than one hundred dollars.

SEC. 5. Any person who may desire a certificate as registered assistant pharmacist, shall apply to the Board of Pharmacy for examination, and shall pay to the secretary of said Board the sum of three dollars. If the Board find that he has had two years' experience in a drug store or pharmacy, where physicians' prescriptions were compounded and dispensed, and is otherwise duly qualified they shall duly register him and issue him a certificate as registered assistant pharmacist. In case of a failure to pass a satisfactory examination, a second examination shall be granted him at any meeting of the Board within six months, without further payment. No registered assistant pharmacist shall open or conduct a pharmacy on his own account, or be granted a certificate as registered pharmacist, until he has passed an examination as herein provided.

SEC. 6. Nothing in this act or of the act of which this is supplemental and amendatory shall be so construed as to prohibit the employment in any pharmacy of an apprentice for the purpose of being instructed in the practice of pharmacy, but such apprentice shall not be permitted to prepare and dispense physicians' prescriptions or to sell or furnish poisons, except in the presence and under the supervision of a registered pharmacist or a registered assistant pharmacist.

SEC. 7. It shall be the duty of the State Board of Pharmacy to investigate all complaints of disregard, non-compliance with or violations of the provisions of this act, and the act to which this is supplemental and amendatory, and to bring all such cases to the notice of the county attorney of the county where such person is doing business, and it shall be the duty of such county attorney to diligently prosecute to effect any such violation.

SEC. 8. Said State Board of Pharmacy shall, on or before the 10th day of January of each year, make an annual report to the Governor of its proceedings for the preceding calendar year, together with an account of all moneys received and disbursed by them in pursuance of this act.

SEC. 9. The Secretary of the State Board of Pharmacy shall, on the application of any party, issue to such applicant a certificate or statement showing that the person named in the application is a registered pharmacist, a registered assistant pharmacist, or neither, as the case may be. The Secretary shall be entitled to and receive a fee of twenty-five cents for each such certificate or statement which he may issue, such fee to accompany the application.

SEC. 10. Original sections two, four, five, six, nine, and twelve of chapter one hundred and fifty of the session laws of 1885, are hereby repealed.

SEC. 11. This act shall take effect and be in force from and after its publication in the official state paper.

Approved March 4, 1887.

I do hereby certify that the foregoing is a true and correct copy of the original enrolled bill now on file in my office.

In testimony whereof I have hereunto subscribed my name and affixed my official seal. Done at Topeka, Kansas, this 4th day of March, A. D. 1887.

[SEAL.] E. B. ALLEN, *Secretary of State.*

MICHIGAN PHARMACY LAW: AMENDMENTS.

AN ACT TO AMEND SECTION TEN OF ACT ONE HUNDRED AND THIRTY-FOUR OF THE PUBLIC ACTS OF EIGHTEEN HUNDRED AND EIGHTY-FIVE, ENTITLED "AN ACT TO REGULATE THE PRACTICE OF PHARMACY IN THE STATE OF MICHIGAN."

SECTION 1. *The People of the State of Michigan enact*, That section ten of act one hundred and thirty-four of the public acts of eighteen hundred and eighty-five, entitled "An act to regulate the practice of pharmacy in the State of Michigan," be, and the same is hereby, amended so as to read as follows:

SEC. 10. Nothing in this act shall apply to, or in any manner interfere with, the business of any practicing physician who does not keep open shop for retailing, dispensing or compounding of medicine and poison, or prevent him from supplying to his patients such articles as may seem to him proper, nor with the vending of patent or proprietary medicines by any retail dealer, *who has been in such business three years or more*, nor with the selling by any person of drugs, medicines, chemicals, essential oils and tinctures which are put up in bottles, boxes, packages, bearing labels securely affixed, which labels shall bear the name of the pharmacist or druggist putting up the same, the dose that may be administered to persons three months, six months, one year, three years, five years, ten years, fifteen years and twenty one years of age, and if a poison, the name or names of the most common antidotes; of copperas, borax, blue vitriol, salt-peter, pepper, sulphur, brimstone, Paris green, liquorice, sage, senna leaves, castor oil, sweet oil, spirits of turpentine, glycerin, Glauber salts, epsom salts, cream tartar, bicarbonate of soda, sugar of lead, and such acids as are used in coloring and tanning, nor with the selling of paregoric, essence of peppermint, essence of ginger, essence of cinnamon, hive syrup, syrup of ipecac, tincture of arnica, syrup of tolu, syrup of squills, spirits of camphor, number six, sweet spirits of nitre, laudanum, quinine, and all other preparations of cinchona bark, tincture of aconite, and tincture of iron, compound cathartic pills, or quinine pills, nor with the exclusively wholesale business of any dealer; *Provided*, That every person who shall within three months after this act takes effect forward to the Board of Pharmacy satisfactory proof, supported by his affidavit, that he was engaged in the business of a dispensing pharmacist on his own account in this State, in the preparation of physicians' prescriptions, three years next previous to the second day of June, 1885, or that at such time he had been employed or engaged three years or more as a pharmacist in the compounding of physicians' prescriptions, and was at said time so employed in this State, shall, upon the payment to the Board of a fee of two dollars, be granted the certificate of a registered pharmacist. *And provided further*, That the said Board may grant, at a fee not exceeding one dollar, to such person not less than sixteen years of age, who shall pass a satisfactory examination touching their competency, before the Board of Pharmacy, the certificate of registered "assistant," but such certificate shall not entitle the holder to engage in business on his own account, or to take charge of or act as manager of a pharmacy or drug store.

Approved June 18, 1887.

OHIO PHARMACY LAW: AMENDMENTS.

SECTION 4410 (as amended March 21st, 1887). No person not a qualified assistant shall be allowed by the proprietor or manager of any retail drug or chemical store to compound or dispense the prescriptions of physicians, except as an aid under the supervision of a registered pharmacist or his qualified assistant.

SEC. 4411 (as amended March 21st, 1887). A qualified assistant, within the meaning of this chapter, shall be a clerk or assistant in a retail drug or chemical store, who shall furnish to the Ohio Board of Pharmacy such evidence of his employment as is required by section forty-four hundred and seven; or a person holding the certificate of said Board, as an assistant pharmacist, as provided in section forty-four hundred and eight; but it shall be unlawful for such assistant pharmacist, or qualified assistant, to supervise or manage any pharmacy or retail drug or chemical store, or to engage in the occupation of compounding or dispensing medicines on prescriptions of physicians, or of selling at retail for medicinal purposes, any drugs, chemicals, poisons, or pharmaceutical preparations, except when engaged or employed in a pharmacy, retail drug or chemical store, which is in charge of and is under the supervision and management of a registered pharmacist.

SEC. 4412 (as amended March 21st, 1887). Any person owning a pharmacy, retail drug or chemical store, who, in violation of the provisions of section 4405 of this act, causes or permits the same to be conducted or managed by a person not a registered pharmacist, shall be deemed guilty of a misdemeanor, and upon conviction thereof, shall be fined in any sum not less than twenty dollars, nor more than one hundred dollars, and each week that he shall cause or permit such pharmacy, retail drug or chemical store to be so conducted or managed shall constitute a separate and distinct offense, and render him liable to a separate prosecution and punishment therefor; a person violating the provisions of section forty-four hundred and seven, relating to registration, renewal of registration, or failing to conspicuously expose such certificate of registration, shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be fined in any sum not exceeding one hundred dollars for each week he continues to carry on or to be engaged in such business without such registration or such exposure of such certificate of registration, or renewal thereof. And for the violation of any of the provisions of section 4410, such proprietor or manager shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be fined in any sum not exceeding fifty dollars for each and every offense; and for violation of any of the provisions of section 4411, such assistant pharmacist shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be fined in any sum not exceeding fifty dollars for each and every offense. All fines assessed for the violation of any of the provisions of this act shall be placed in the county treasury, for the use and benefit of the common school fund of the county in which such offense is committed; provided, that nothing in this act shall be so construed as to in any way affect the right of any person to bring a civil action against any person referred to in this act for any act or acts for which a civil action may now be brought. It shall be the duty of the Ohio Board of Pharmacy, upon application therefor being made to said Board, to cause the prosecution of any person or persons violating any of the provisions of this act.

WISCONSIN PHARMACY LAWS.

§ 1. Forbids compounding or sale of drugs, medicines or poisons, except by registered pharmacists.
§ 2. Who shall register.
§ 3. Who shall be graduates in pharmacy.
§ 4. Who shall be licentiates in pharmacy.
§ 5. Board of Pharmacy—Governor to appoint—Wisconsin Pharmaceutical Association to nominate candidates for appointment as members.
§ 6. Organization of Board—Duties of members and officers—Examination of applicants for registry—Meetings—Quorum.
§ 7. Requirements of persons claiming registry.
§ 8. "Assistant pharmacists" to be registered—Fees.
§ 9. Certificate for pharmacists, and fees for the same.
§ 10. Annual fees—Certificates to be open for public inspection.
§ 11. Duties of secretary of Board, and salary—To be treasurer of the Board—Bond—Disposition of funds.
§ 12. Requires compliance with the provisions of this act within ninety days—Penalty for failure to comply—Exemptions.
§ 13. Forbids adulteration of drugs—Penalty for same—Board of Pharmacy may appoint analyst—Board to prosecute violations of this act.
§ 14. All poisons to be labeled.
§ 15. Prosecution of suits—Duty of State's Attorneys—Disposition of penalties collected.
§ 2, Ch. 296. Permits to sell intoxicating liquor shall be granted to pharmacists under certain conditions.
§ 5, Ch. 296. Penalty for making false statements to pharmacists or clerk.

CHAPTER 167, LAWS OF 1882, AS AMENDED IN 1885 AND 1887.

AN ACT TO REGULATE THE PRACTICE OF PHARMACY, THE LICENSING OF PERSONS TO CARRY ON SUCH PRACTICE, AND THE SALE OF POISONS IN THE STATE OF WISCONSIN.

The people of the State of Wisconsin, represented in Senate and Assembly, do enact as follows:

SECTION 1, as amended by chapter 146, laws of 1885. "That it shall hereafter be unlawful for any person, other than a registered pharmacist, to retail, compound, or dispense drugs, medicines, or poisons, except Paris green, when kept in stock, put up in pound and half pound packages, or to institute or conduct any pharmacy, store, or shop for retailing, compounding, or dispensing drugs, medicines, or poisons, unless such person shall be a registered pharmacist, or shall employ and place in charge of such pharmacy, store, or shop, a registered pharmacist within the full meaning of this act, except as hereinafter provided."

SEC. 2. In order to be registered within the full meaning of this act, all persons must be either graduates in pharmacy, or shall at the time this act takes effect be engaged in the business of a dispensing pharmacist on their own account, in the State of Wisconsin, in the preparation of physicians' prescriptions, and in the vending and compounding of drugs, medicines and poisons, or shall be licentiates in pharmacy.

SEC. 3. Graduates in pharmacy shall be considered to consist of such persons as have had four years' practical experience in drug stores where prescriptions of medical practitioners are compounded, and have obtained a diploma from such colleges or schools of pharmacy as shall be approved by the Board of Pharmacy, such as shall be judged by the said Board of Pharmacy as sufficient guarantee of their attainments and proficiency.

SEC. 4, as amended by chapter 460, laws of 1887. Licentiates in pharmacy shall be such persons as shall have had five years' practical experience in drug stores wherein prescriptions of medical practitioners are compounded, and have sustained a satisfactory examination before the State Board of Pharmacy hereinafter mentioned. The State Board may grant certificates of registration to licentiates of such other State Boards as it may deem proper, without further examination. It shall be the duty of the said Board to grant an assistant's certificate to such persons as have had two years' practical experience in drug stores where prescriptions of medical practitioners are compounded, and have passed a satisfactory examination before said Board of Pharmacy. The holder of such assistant's certificate shall, however, be deemed competent to sell, vend and compound on his own account such medicines as are required by the general public, in towns or villages having less than five hundred inhabitants.

SEC. 5. Immediately upon the passage of this act, the Wisconsin Pharmaceutical Association shall elect ten reputable and practicing pharmacists doing business in the State, from which number the Governor of the State shall appoint five. The said five pharmacists, duly elected and appointed, shall constitute the Board of Pharmacy of the State of Wisconsin, and shall hold office as respectively designated in their appointments, for the term of one, two, three, four and five years respectively, as hereinafter provided, and until their successors have been duly appointed and qualified. The Wisconsin Pharmaceutical Society shall annually thereafter elect three pharmacists, from which number the Governor of the State shall appoint one to fill the vacancy annually occurring in said Board. The term of office shall be five years. In case of resignation or removal from the State of any member of said Board, or of a vacancy occurring from any cause, the Governor shall fill the vacancy by appointing a pharmacist from the names last submitted, to serve as a member of the Board for the remainder of the term.

SEC. 6. The said Board shall, within thirty days of its appointment, meet and organize by the selection of a president and secretary from the number of its own members, who shall be elected for the term of one year, and shall perform the duties prescribed by the Board. It shall be the duty of the Board to examine all applications for registration submitted in proper form; to grant certificates of registration to such persons as may be entitled to the same under the provisions of this act; to cause the prosecution of all persons violating its provisions; to report annually to the Governor and to the Wisconsin Pharmaceutical Society upon the condition of pharmacy in the State, which said report shall also furnish a record of the proceedings of said Board for the year, as well as the names of all pharmacists duly registered under this act. The Board shall hold meetings for the examination of applicants for registration and the transaction of such other business as shall pertain to its duties, at least once in three months. And the State Board shall give thirty days' public notice of the time and place of such meeting. The said Board shall also have power to make by-laws for the proper execution of its duties under this act, and shall keep a book of registration, in which shall be entered the names and places of business of all persons registered under this act, which registration book shall also contain such facts as said persons shall claim to justify their registration. Three members of said Board shall constitute a quorum.

SEC. 7. Every person claiming the right of registration under this act, who shall, within three months after the passage of this act, forward to the Board of Pharmacy satisfactory proof, supported by his affidavit, that he was engaged in the business of dispensing pharmacist on his own account in the State of Wisconsin at the time of the passage of this act, as provided in section 2, shall, upon the payment of the fee hereinafter mentioned, be granted a certificate of registration: provided, that in case of failure or neglect to register as herein specified, then such person shall, in order to be registered, comply with the requirements provided for registration as graduates in pharmacy or licentiates in pharmacy within the meaning of this act.

SEC. 8. Any person engaged in the position of assistant or clerk in a pharmacy at the time this act takes effect, no less than eighteen years of age, who shall have had at least two years' practical experience in drug stores where the prescriptions of medical practitioners are compounded, and who shall furnish satisfactory evidence to that effect to the State Board of Pharmacy, shall, upon making application for registration and upon payment to the Secretary of said Board of a fee of one dollar, within sixty days after this act takes effect, be entitled to a certificate as a "registered assistant," which certificate shall entitle him to continue in such duties as clerk or assistant; but such certificate shall not entitle him to engage in business on his own account; except as provided in section 4, or to the certificate of registered pharmacist, unless he shall have had at least five years' experience in such stores where the prescriptions of medical practitioners are compounded, at the time of the passage of this act. Thereafter he shall pay annually to the said Secretary a sum not exceeding fifty cents, during the time he shall continue in such duties, in return for which sum he shall receive a renewal of his certificate.

SEC. 9. Every person claiming registration as a registered pharmacist under section 7 of this act shall, before a certificate is granted, pay to the Secretary of said Board of Pharmacy the sum of two dollars, and a like sum shall be paid to said Secretary by graduates in pharmacy and by such licentiates of other Boards who shall apply for registration under this act; and every applicant for registration by examination shall pay to the said Secretary the sum of five dollars before such examination be attempted; provided, that in case the applicant fails to sustain a satisfactory examination by the said Board, his money, the said five dollars, shall be refunded to him.

SEC. 10, as amended by chapter 460, laws of 1887. Every registered pharmacist who desires to continue the practice of his profession shall annually, during the time he shall continue such practice, on such date as the Board of Pharmacy may determine, pay to the Secretary of said Board a registration fee, the amount of which shall be fixed by the Board, and which in no case shall exceed two dollars, in return for which payment he shall receive a renewal of said registration. Every certificate of registration and every renewal of such certificate shall be conspicuously exposed in the pharmacy to which it applies, and if any registered pharmacist or assistant pharmacist shall fail or neglect to conspicuously expose such certificate, he shall be fined not less than five and not more than ten dollars and costs for each and every offense.

SEC. 11. The Secretary of the Board of Pharmacy shall receive a salary which shall be determined by said Board; he shall also receive his traveling and other expenses incurred in the performance of his official duties. The other members of said Board shall receive the sum of five dollars for each day actually engaged in such service and all legitimate and necessary expenses incurred in attending the meetings of said Board. Said expenses shall be paid from the fees and penalties received by said Board under the provisions of this act; and no part of the salary or other expenses of said Board shall be paid out of the public treasury. All moneys received by said Board in excess of said allowances and other expenses hereinbefore provided for, shall be held by the Secretary of said Board as a special fund for meeting the expenses of said Board, said Secretary giving such bonds as the said Board shall from time to time direct. The said Board shall, in its annual report to the Governor and to the Wisconsin Pharmaceutical Association, render an account of all moneys received and disbursed by them pursuant to this act.

SEC. 12, as amended by chapter 460, laws of 1887. Any member not being or not having in his employ a registered pharmacist, within the full meaning of this act, except as provided in section 4, who shall, after the expiration of ninety days from the passage of this act, keep a pharmacy, store, or shop for retailing, compounding or dispensing medicines, or who shall take, use, or exhibit the title of a registered pharmacist, shall for each and every offense, be liable to a penalty of fifty dollars. Any registered pharmacist or any person who shall permit the compounding or dispensing of prescriptions or the vending of drugs, medicines, or poisons in his store or place of business, except under the personal supervision of a registered pharmacist, or except by a registered assistant pharmacist, or any pharmacist or "registered assistant" who, while continuing in business, shall fail or neglect to procure his annual registration, or any person who shall wilfully make any false representation to procure registration for himself or any other person, or who shall violate any other provision of this act, shall, for each and every such offense, be liable to a penalty of fifty dollars; provided, that nothing in this act shall in any manner interfere with the business of any physician in regular practice, or prevent him from supplying to his patients such articles as may seem to him proper, nor with the making and vending of proprietary medicine or medicines placed in sealed packages, with the name of the contents and of the pharmacist or physician by whom prepared or compounded, nor with the sale of the usual domestic remedies by retail dealers, nor with the exclusively wholesale business of any dealers, except as heretofore provided.

SEC. 13. Every proprietor or conductor of a drug store shall be held responsible for the quality of all drugs, chemicals and medicines sold or dispensed by him, except those sold in the original package of the manufacturer, and except those articles or preparations known as patent or proprietary medicines. And should such proprietor or conductor of a drug store, knowingly, intentionally and fraudulently adulterate or cause to be adulterated such drugs, chemicals or medical preparations, he shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be liable to a penalty of not less than seventy-five dollars nor more than one hundred and fifty dollars, and his name stricken from the register.

SEC. 14. No persons shall sell at retail any poisons commonly recognized as such, and especially aconite, arsenic, belladonna, biniodide of mercury, carbolic acid, chloral hydrate, chloroform, conium, corrosive sublimate, creosote, croton oil, cyanide of potassium, digitalis, hydrocyanic acid, laudanum, morphine, nux vomica, oil of bitter almonds, opium, oxalic acid, strychnine, sugar of lead, sulphate of zinc, white precipitate, red precipitate, without affixing to the box, bottle, vessel or package containing the same, and to the wrapper or cover thereof, a label bearing the name "poison," distinctly shown, together with the name and place of business of the seller. Nor shall he deliver any of the said poisons to any person without satisfying himself that such poison is to be used for legitimate purposes; provided, that nothing herein contained shall apply to the dispensing of physicians' prescriptions specifying any of the poisons aforesaid. Any person failing to comply with the requirements of this section shall be deemed guilty of a misdemeanor, and shall be liable to a fine of not less than five dollars for each and every such omission.

Sec. 15, as amended by chapter 460, laws of 1887. All suits for the recovery of the several penalties prescribed in this act shall be prosecuted in the name of the State of Wisconsin, in any court having jurisdiction; and it shall be the duty of the district attorney of the county wherein such offense is committed, to prosecute all persons violating the provisions of this act upon proper complaint being made. All penalties collected under the provisions of this act shall inure to the school fund of the State.

SEC. 16. All acts or portions of acts regulating the practice of pharmacy and the sale of poisons within this State, enacted prior to the passage of this act, are hereby repealed; provided, that nothing in this act shall be so construed as to prevent any person who has once been a registered member, and may have forfeited his membership by non-payment of dues or fees, from renewing his membership by paying the required dues or fees without examination.

CHAPTER 296, LAWS OF 1885, AS AMENDED RELATING TO THE SALE OF POISONS BY PHARMACISTS, ETC.

SECTION 2, as amended by chapter 404, laws of 1887. There is hereby enacted a new section, to be known as section 1548 a of the revised statutes, which shall read as follows: Section 1548 a. The town boards, village boards, and common councils of the respective towns, villages and cities in this state, upon the written application of any registered pharmacist, may grant to such registered pharmacists as they deem proper a permit to sell strong, spirituous and ardent liquors in quantities less than one gallon, for medicinal, mechanical or scientific purposes only, and not to be drunk on the premises. The sum to be paid for such permit shall be ten dollars, and such permit shall be granted and issued in the same manner and terminate at the same time as the license provided for in the preceding section, except that it shall not be necessary for any such registered pharmacist to furnish the bond required by section 1549, of the revised statutes; provided, that in case any town board, village board, or common council shall refuse to grant such permit. any registered pharmacist may sell such strong, spirituous and ardent liquors, for medicinal purposes only, on the written prescription for each sale, of a practicing physician, competent to testify in any court in this state in a professional capacity, as provided by section 1436 of the revised statutes. It shall be the duty of every pharmacist to whom a permit is issued to keep a book, in which he shall enter the date of every sale made by him of any such liquors, the name of the person to whom sold, and the kind and quantity of and purpose for which such liquors are sold; and such book shall at all times be open to the inspection of the authorities granting such permit. It shall be the duty of every such pharmacist, on the third Tuesday of April in each year, to file with the clerk of the city, village or town in which the permit is granted, a verified copy of all the entries made by him in such book, as he is required by this section to keep.

SEC. 5. There is hereby enacted a new section to be known as section 1550a, of the revised statutes, which shall read as follows: Section 1550a. Any person who shall, for the purpose of inducing the sale of liquors by any registered pharmacist, holding a permit therefor, for any other use than medicinal, mechanical, or scientific purposes, make any false statement or representation to such pharmacist, or any clerk or employe of such pharmacist, regarding the use for which such liquor is bought, and thereby induce such sale to be made in violation of law, or any registered pharmacist holding a permit under this chapter, who shall neglect or refuse to comply with any of the requirements of this chapter, shall be guilty of a misdemeanor, and on conviction thereof, shall be punished therefor by a fine of not less than ten dollars or more than forty dollars, besides the costs of suit; and in case of a second or any subsequent conviction of the same person, the punishment shall be by a fine of not less than forty dollars or more than one hundred dollars, besides the costs of suit; or by imprisonment, in the county jail of the proper county, not less than thirty days or more than three months; and in case of punishment by fine, such person shall, unless the fine and costs be paid forthwith, be committed to the county jail of the proper county until such fine and costs are paid, or until discharged by due course of law.

MINUTES

OF THE

THIRTY-FIFTH ANNUAL MEETING.

FIRST SESSION—MONDAY AFTERNOON, SEPTEMBER 5, 1887.

The American Pharmaceutical Association assembled at its Thirty-fifth Annual Meeting in the "Odeon" in the city of Cincinnati, Ohio, on Monday, September 5th. In the absence of President Tufts, First Vice-President Henry J. Menninger occupied the chair.

At 3:30 p. m. the meeting was called to order, more than a quorum being present, and the Acting President introduced to the Association the Mayor of Cincinnati, Hon. Amor Smith, Jr., who addressed the meeting as follows:

MR. PRESIDENT, GENTLEMEN AND LADIES OF THE AMERICAN PHARMACEUTICAL ASSOCIATION:

Surprises never come singly, and while I have been very well entertained to-day in receiving societies from abroad that are visiting brother associations in Cincinnati, I was also agreeably surprised this morning by a call from a member of your committee saying that this Association was to meet to-day in this hall. You must not condemn what might appear the tardiness of your committeeman in endeavoring to carry out his instructions in inviting the Mayor to receive you, for the reason that I myself have been out of the city for some time. While I do not believe it came in the nature of a complaint, yet at the same time I have been told that it was a surprise—my leaving the city for a short time. (Applause.) Yet, as I have been the subject of congratulation upon that account, I congratulate you to-day even in my surprise at the numbers who have come from abroad to attend this meeting. I have been told that this meeting consummates more than one-third a century in the organization of this Society, and when we contemplate that thirty-five years have rolled over the heads of the members of the Society, we may judge from the ages of the men who come together annually or who have founded it, that certainly there is wisdom in the Society. For any person who has lived and gone through the requisites of the studies and life of a pharmacist cannot help but acquire that knowledge that comes only to the student. Add to that thirty-five years' experience in acquiring knowledge and becoming experts, an Association like this should be fully qualified to teach those of our fellow-citizens who are coming up in the colleges to seek the road that they should follow. Your Association gathers from throughout the whole land, and brings the brightest minds together; you read your essays, and make your record, and at the close of the convention compile the records and send them forth to the world for all persons desiring to acquire this kind of knowledge, to receive the benefit of the best brains of the community. (Applause.) You come here from all parts of the land. I am told that there are delegates here from the slopes of the Pacific, and I met a delegate from the far east where the statue of Liberty stands representing this nation enlightening the world. I know that there are those who come from the sunny south, where the balmy breezes and the fragrance of the orange trees teach you to wish that you might meet.

I welcome you all, from wherever you may come, heartily on behalf of the citizens of Cincinnati. You will find in Cincinnati, I hope, that which will be pleasant to you. Within this hall you will find an Association that cannot but be pleasant to the thinking minds of the world. This hall is used daily throughout the year by the students who gather in this College of Music, and from early morning until late at night the melodious voices of the singers of this country practice here to become perfected. Already the renown of this College is spread throughout the land. We have also medical colleges here—something that you gentlemen no doubt know about. We have here a College of Pharmacy. We have an art museum which I hope all of you may visit, because if you go away without having done so you may regret it. The art school is attended by four hundred pupils. One of our most benevolent citizens, a philanthropist by the name of David Sinton, is building at this time, at the cost of $75,000, a house where the students may become perfected in their profession. Both the College of Music and the Art Museum have a corps of professors that cannot well be surpassed. There are other things that are peculiar to Cincinnati. We have, in the way of entertainment, Rome under Nero, and I hope you will all go to see it. It is essentially a Cincinnati project. The acrobats, the singers, the musicians, and all that take part in that play, and the artist who did the painting, are Cincinnati talent, the artist who did the painting being a graduate of the Art School of which I have just been speaking. Now that you are here, on behalf of the citizens of Cincinnati, speaking as its Chief Executive, and speaking from my heart, knowing the hospitality of our citizens, I bid you a hearty welcome, and I hope that this meeting of yours will prove a benefit, both socially and intellectually and—perhaps the term is a little long—remuneratively, far in advance of any meeting you have had heretofore. I bid you again a hearty welcome. (Applause.)

The acting President responded to Mayor Smith's address as follows:

On behalf of the A. P. A. I accept your tendered hospitality of the city, and will but incidentally remark that your kind words to us have convinced us of the truth of your allegation that music resounds in these halls every day of the year. We realize that it did so just now; it did so especially on this occasion. This is the third time that our Association has visited your city during the past thirty-two years. We have left here with pleasant recollections every time, and each succeeding time with a deep impression of the energy, perseverance and growth of this Queen City of the West. On our coming here for the third time we are again astonished at the growth you have made. I thank you, sir, on behalf of the Association, and assure you that we will not call on the police force of the city to do any extra duty during our stay. (Applause.)

The acting President stated with the brief notice that he would be called upon to preside on the present occasion, he had not been able to prepare an address in accord with the requirements of the By-Laws; but in lieu of such an address he would offer the following remarks:

Fellow Members of the American Pharmaceutical Association: In the absence of your President the pleasant duty devolves upon me to preside over your deliberations.

It has been the custom of the President of the Association in its earlier history to review the scientific progress of pharmacy; but during the last fifteen years, that duty has devolved upon a special officer, "The Reporter on the Progress of Pharmacy." My predecessors in the chair have seen fit at various times to make suggestions in relation to the business management of the Association, such recommendations being based upon the experience of the executive officers. While I have much to recommend and have decided opinions in relation to these subjects, I am constrained to suggest but very little.

At our last annual meeting at Providence, you appointed a "Committee on Management." Having been a participant in the deliberations of that Committee, my own opinions and recommendations are largely those which the report of the committee will bring before you. The main features of that report may be briefly stated to be the allotment of special and specified time for the consideration of the several subjects which naturally will and should engage our attention. Prominent among these are the scientific, the trade, the educational, and the legislative interests of practicing pharmacists. For many years two of these subjects at least received little or no attention.

The neglect of trade interests led to the formation of the "National Retail Druggists' Association." It was soon found that the membership of the two associations was almost identical. Members of the parent Association soon realized that with justice and propriety and with more probability of success, the members can work with better effect by uniting the entire pharmaceutical profession of the country in one strong organization; and thus after many interchanges of opinions between the two, we may be said to celebrate to-day the marriage of the American Pharmaceutical Association to the National Retail Druggists' Association. This union is not only justified by the needs and even necessities of the profession and trade, but finds its counterpart in the countries of the so-called older world; notably the British Pharmaceutical Conference and the German Apothecaries' Union, both of which have worked on the basis of promoting all interests of the profession with eminent success. Let us hope then that to day, in the prosperous city of Cincinnati, that typical city of the result of American energy and of the united effort of its inhabitants, a renewed vigor may permeate our national organization. That this union of the trade and scientific interests was contemplated by at least some of the founders of the American Pharmaceutical Association, is evidenced by a report made at the convention held in Philadelphia in the year 1852, when this Association was organized. At that time a committee composed of those Nestors of American pharmacy, Wm. Procter, Jr., Sam'l. M. Colcord, and Geo. D. Coggeshall, said in a report:

"The number of pharmaceutists constituting the professional body in the United States is large, comprehends all grades of qualification, and extends to every city and town in the country. The professed object of the present Convention being to adopt measures calculated to benefit this large body of citizens, in a professional point of view, by showing that there exist many grounds of sympathy between them, notwithstanding the present want of united action; we believe that the institution of a *National Association*, whose members may come from all sections of the country, is calculated to enlist this feeling of brotherhood, and direct its power, as a forming force, towards the elevation of the average standard of qualification now existing."

That was written over thirty years ago, and I feel that it is true at this moment. Following that spirit, gentlemen, this Association should be a representative body, embracing in its membership all who are honorably laboring in the profession. That all pharmacists of North America are not as well educated as our more advanced brethren would like to have them, cannot be denied. Yet every American can point with pride to the gradual yet rapid elevation of the profession in this country during the last two decades. "Rome was not built in a day." When we look at the condition, both civil and mental, of our brethren of the Old World, we have no cause to blush for ours, in comparison. The greater part of our country was but a vast wilderness a century ago. Overcoming many obstacles to which only an allusion can here be made, the separated settlements and colonies have grown and developed, until to-day we stand side by side, elbow to elbow, a united, prosperous people, challenging in our educational institutions as well as in civic affairs the criticism of the world.

Gentlemen, our Association is to-day in a very prosperous condition. The reports of the several permanent officers of the Association will be presented to you. While but a few years ago our treasury was almost empty, we have to-day a surplus of nearly $12,000.

This meeting will, I hope, by the adoption of the plan presented by your Committee on Management, be the beginning of a new era of prosperity and usefulness. While the recommendations of your Committee are to be discussed by you, let me hope that opposing views will be advocated in the true spirit of the educated man, and that the judgment which you will render may illustrate your temper at the time that it was done, "With malice toward none, and charity for all."

The Secretary of Council read the names of thirty-one applicants for membership whose applications had been examined by the Council.

The presentation of reports of committees being next in order, the following were read by title and laid upon the table for future action: Report of the Committee on the Drug Market; on Prize Essays; on Legislation; on Management; on Visit to the National Wholesale Drug Association; on the Introduction of Foreign Medicinal Plants, and the Report of the Committee on National Formulary.

The Permanent Secretary read the Report on Credentials which had been examined and approved by the Council, and showed that credentials had been received from the following Associations of Pharmacists:

From Colleges of Pharmacy.—Chicago, Cincinnati, Cleveland, Louisville, Maryland, Massachusetts, National (Washington, D. C.), New York, Philadelphia, Pittsburgh and St. Louis.

From State Pharmaceutical Associations.—Alabama, Arkansas, Connecticut, Florida, Illinois, Iowa, Kansas, Kentucky, Louisiana, Massachusetts, Michigan, Minnesota, Missouri, Nebraska, New Hampshire, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia, Wisconsin and Province of Quebec.

From County or City Associations.—Berrien Co., Mich.; Detroit, Mich.; Kings Co., N. Y.; Nashville, Tenn.

From Alumni Associations of the Colleges of Pharmacy of Chicago, Cincinnati, Louisville, New York, Philadelphia, St. Louis, and University of Michigan.

The appointment of the Nominating Committee being next in order, the delegations of the various Colleges of Pharmacy and State Pharmaceutical Associations named the following to serve on that committee:

COLLEGES OF PHARMACY.

Chicago.—A. E. Ebert.
Cincinnati.—T. L. A. Greve.
Cleveland.—G. L. Hechler.
Louisville.—E. Scheffer.
Massachusetts.—J. W. Colcord.
National (Washington, D. C.).—H. E. Kallusowski.
New York.—T. J. Macmahan.
Philadelphia.—H. Trimble.
St. Louis.—H. M. Whelpley.

STATE PHARMACEUTICAL ASSOCIATIONS.

Alabama.—P. C. Candidus.
Arkansas.—E. R. Goodwin.
Florida.—H. C. Cushman.
Illinois.—C. W. Day.
Iowa.—Rosa Upson.
Kansas.—Rob. J. Brown.
Kentucky.—E. C. Pfingst.
Louisiana.—A. K. Finlay.
Massachusetts.—Henry Canning.
Michigan.—D. O. Haynes.
Minnesota.—Karl Simmon.
Missouri.—G. H. C. Klie.
Nebraska.—E. J. Seykora.
New York.—G. J. Seabury.
Ohio.—L. C. Hopp.
Pennsylvania.—J. W. Miller.
Virginia.—T. R. Baker.
West Virginia.—C. Menkemeller.
Wisconsin.—A. H. Hollister.

The credentials from the Indiana State Pharmaceutical Association not having come to hand, Mr. Geo. W. Sloan was, on motion, authorized to represent that Association on the Nominating Committee.

The delegations from the State Associations of Connecticut and New Jersey not being present, motions were made and adopted that Mr. F. Wilcox represent the former and Mr. E. A. Sayre the latter Association on the Nominating Committee.

On motion of Mr. Macmahan, the Nominating Committee was authorized to receive the representatives of other delegations from Colleges of Pharmacy and State Pharmaceutical Associations who may arrive in time for the labors of that Committee.

The chair appointed the following, in addition to the above, from the members not coming as delegates: J. P. Remington, Philadelphia; Geo. H. Schafer, Fort Madison, Ia.; Leo Eliel, South Bend, Ind.; John Weir, Cincinnati; and D. S. Carraway, Chattanooga, Tenn.

The Secretary of Council, Geo. W. Kennedy, read the minutes of that body since the adjournment of the meeting of the Association in 1886. On motion, these minutes were approved. The minutes of the fourth and fifth sessions of Council are printed in the Proceedings for 1886, page 190. Preceding the sixth session of Council, held in Cincinnati, the following business was transacted by correspondence:

October 22, 1886. *Resolved*, That the picture of Edward S. Wayne be placed in the Proceedings for 1886.

January 11, 1887, on motion of J. M. Maisch, seconded by Wm. S. Thompson,

Resolved, That the following recommendation from the National Formulary Committee be adopted:

That the Council of the American Pharmaceutical Association authorize the Treasurer of the Association to pay to the Treasurer of this Committee, Mr. Wm. P. De Forrest (corner 5th Avenue and Dean street, Brooklyn, N. Y.) the sum of fifty dollars for defraying the running expenses, the said sum to be properly accounted for before the next annual meeting.

January 28, 1887, on motion of A. E. Ebert, seconded by Geo. W. Kennedy,

Resolved, That the Committee on Membership of the American Pharmaceutical Association grant to any member in good standing the privilege of soliciting and securing new members, and that the Committee on Membership be instructed to have blanks of application printed, and to furnish these blanks to any member who desires to aid in obtaining new members.

February 1, 1887, on motion of J. L. Lemberger, seconded by Wm. S. Thompson, *Resolved*, That the Chairman of the Council be, and is hereby, authorized to have printed as many copies of the report of the Auditing Committee as he may believe are required for the use of the Council.

The report of the Auditing Committee was accompanied by the following statements of the Treasurer for the fiscal year 1885–1886, which had not been printed with his annual report (see Proceedings 1886, page 150).

FROM THE TREASURER'S REPORT FOR THE YEAR 1885–86.

1886.	RECEIPTS.		
July 1.	Balance of old account, July 1, 1885.		$4278 79
	Amount received for contributions to July 1st	$4845 00	
	" for memberships	265 00	
	" from the sale of Proceedings	59 65	
	" for certificates	97 50	
	" from the sale of badges.	23 50	
	" from the Centennial Fund.	7 50	
	" from interest on deposits	105 49	
			5403 64
			$9682 43

EXPENDITURES.

Proceedings.	Certificate.	Date.	No.		
		1885.			
		Aug. 22.	293.	By paid George W. Kennedy, Expenses.	$107 54
		Sept. 8.	294.	" Samuel A. D. Sheppard, Expenses	33 80
		8.	295.	" John M. Maisch, Expenses	37 00
		10.	296.	" George W. Kennedy, Expenses.	200 00
$750 00		10.	297.	" C. Lewis Diehl, Proceedings	
		11.	298.	" John M. Maisch, Expenses	31 83
125 00		17.	299.	" Cyrus R. Morgan, Stenographer.	
		30.	300.	" George W. Kennedy, Expenses.	8 73
35 30		Oct. 10.	301.	" Inquirer Printing Company, Proceedings.	
		13.	302.	" George A. Kelley, Expenses	100 00
		Nov. 4.	303.	" Charles Rice, Expenses	9 00
		1886.			
		Jan. 11.	304.	" Joseph P. Remington, Expenses	7 84
		20.	305.	" Joseph P. Remington, Expenses	10 00
		March 2.	306.	" Robert B. Warder, Centennial Award	7 50
		23.	307.	" John M. Maisch, Expenses	70 83
		April 7.	308.	" John M. Maisch, Insurance	15 00
		May 1.	309.	" John M. Maisch, Expenses	199 45
1617 59		4.	310.	" Inquirer Printing Company, Proceedings.	

60 00		May	4. 311.	By paid Frederick Gutekunst, Proceedings.	
		June	4. 312.	" John M. Maisch, Expenses	750 00
			7. 313.	" William B. Burford, Expenses	49 67
			12. 314.	" Charles A. Tufts, Expenses	750 00
			12. 315.	" Charles A. Tufts, Expenses	63 28
	$52 50		12. 316.	" American Bank Note Company, Certificates.	
			24. 317.	" Charles A. Tufts, Expenses	42 47
			24. 318.	" Charles A. Tufts, Expenses	47 01
$2587 89	$52 50				$2540 95
					2587 89
					52 50
					$5181 34
				Balance to new account	4501 09
					$9682 43

Oct. 10, 1885, Life membership fund, E. C. Jones	40 00

1886.

RECEIPTS.

July 1.	Balance on hand July 1st (from old account)		$4278 79
	Amount received from yearly contributions for 1880	$10 00	
	" " 1881	10 00	
	" " 1882	55 00	
	" " 1883	295 00	
	" " 1884	1320 00	
	" " 1885	2515 00	
	" " 1886	640 00	
	" memberships	225 00	
	" Life memberships	40 00	
	" the sale of Proceedings	59 65	
	" " certificates	97 50	
	" " badges	23 50	
	" the Centennial Fund	7 50	
	" interest on deposits	105 49	
			5403 64
			$9682 43

1886.

EXPENDITURES.

July 1.	Paid for Proceedings:		
	Inquirer Printing Company, printing and binding	$1652 89	
	Cyrus R. Morgan, stenographer	125 00	
	Frederick Gutekunst, photographer	60 00	
	C. Lewis Diehl, salary as Reporter of the Progress of Pharmacy from Sept., 1884, to Sept., 1885	750 00	
			$2587 89
	John M. Maisch, salary from Sept., 1885, to Sept., 1886	750 00	
	John M. Maisch, miscellaneous expenses, including the expense attending the meeting at Pittsburg, printing, stationery, freight, expressage, packing boxes and postage	339 11	
			1089 11
	Charles A. Tufts, salary from Sept., 1885, to Sept., 1886	750 00	

Charles A. Tufts, miscellaneous expenses, including the expense attending the meeting at Pittsburg, printing, stationery, expressage, filling out certificates, expenses of collections in cities and postage	152 76	
		902 76
George W. Kennedy, salary as Secretary of the Council from Sept., 1884, to Sept., 1885	50 00	
George W. Kennedy, as Chairman of the Committee on Membership from Sept., 1884, to Sept., 1885	150 00	
George W. Kennedy, expenses for printing and postage . .	116 27	
		316 27
George A. Kelly, for rent of hall at Pittsburg		100 00
Joseph P. Remington, expenses as Chairman of the Council.		17 84
Samuel A. D. Sheppard, expenses of the Examining Committee		33 80
American Bank Note Company, printing certificates . . .		52 50
William B. Burford, printing for Special Committee on Time of Meetings		49 67
Charles Rice, printing circulars.		9 00
Robert B. Warder, award from Centennial Fund by order of the Council.		7 50
Insurance of the property of the American Pharmaceutical Association with the German Fire Insurance Company, stored in the Philadelphia College of Pharmacy		15 00
		5181 34
Balance to new account		4501 09
		$9682 43

LIFE MEMBERS.

1886, July 1st. One member has become a Life Member the past year, and forty dollars have been added in consequence to the Life Membership Fund.

1886.

INVESTMENTS.

July 1. The investments are as follows:

Ebert Fund.

Amount in United States Government Bonds (market value)	$757 50	
Amount deposited in the Savings Bank for the county of Strafford	14 63	
		$772 13

Centennial Fund.

Amount in United States Government Bonds	$1388 75	
Amount deposited in the Savings Bank for the county of Strafford	47 62	
		1436 37

Life Membership Fund.

Amount in United States Government Bonds	1515 00	
Amount deposited in the Savings Bank for the county of Strafford	42 44	
		1557 44
		$3765 94

1886. BILLS RECEIVABLE.

July 1. The following amounts are due the Association:

2	Annual fees,	1880	$10 00
6	"	1881	30 00
19	"	1882	95 00
92	"	1883	460 00
294	"	1884	1460 00
524	"	1885	2620 00
1086	"	1886	5430 00
			$10105 00

1886. LIABILITIES.

July 1. The Association will owe the following bills September 1st:

C. Lewis Diehl,	Reporter on the Progress of Pharmacy	$750 00
George W. Kennedy,	Secretary of the Council.	50 00
"	Chairman of the Committee on Membership.	150 00
"	bills for printing and postage	111 47
		$1061 47

1886. TOTAL ASSETS OF THE ASSOCIATION.

July 1.	Cash on hand.	$4501 09
	Less bills payable	1061 47
		$3439 62
	Total investments	3765 94
		$7205 56
	Prospective assets	10105 00

The following report was printed in sufficient number to place a copy in the hands of each member of the Council and of each member attending the annual meeting in Cincinnati:

REPORT OF THE COMMITTEE APPOINTED BY THE COUNCIL AT THE PROVIDENCE MEETING TO AUDIT THE BOOKS AND ACCOUNTS OF THE LATE TREASURER.

To the Council of the American Pharmaceutical Association:

GENTLEMEN: At the first session of the meeting of this Council, held in Providence, R. I., September 8, 1886, the undersigned chairman received his appointment as such, with authority to select two other members of the Association, for the purpose of auditing the books and accounts of the late Treasurer, Chas. A. Tufts, before turning them over to the new Treasurer, S. A. D. Sheppard; and in obedience to above instructions the chairman was pleased to select Messrs. Henry Canning and Linus D. Drury, who, having served upon the Examining Committee for several years, kindly acceded to the request, and herewith we beg to submit for your consideration the result of our examination.

In the examination of the Treasurer's report for the financial year ending July 1, 1886, your Committee report as follows, to wit:

The Treasurer reports—

45 memberships @ $5.00	$225 00

And your Committee find—

42 memberships @ $5.00 . . . . $210 00

Of these 42 memberships, 34 appear in the printed Proceedings of 1885 as elected, and the 8 others do not thus appear, but are found in the ledger and cash-book. The names of these 8 are: A. T. Fleischmann, Sedalia, Mo.; C. F. Rickey, Mt. Sterling, Ill.; J. A. Treat, Stuart, Iowa; J. Feil, Cleveland, Ohio; A. B. Stevens, F. W. R. Perry, A. W. Allen, and A. B. Lyons, Detroit, Mich.*

Your Committee find the following differences in the items of receipts:

The Treasurer reports as received—

264 payments for 1884	$1320 00
128 payments for 1886	640 00
	$1960 00

Your Committee find—

262 payments for 1884	$1310 00
133 payments for 1886	665 00
	$1975 09

A difference of $15.00.

It will be noted that this difference offsets the difference between the Treasurer's report and the Committee's findings in regard to membership fees.

In the Treasurer's report of expenditures your Committee find missing an item of forty dollars ($40), which was duly entered as received in the list of receipts and deposited in the savings bank to the credit of the life membership fund; he therefore should have taken a credit for this amount.

Your Committee find the following differences as to the amounts due the Association.

The Treasurer reports as follows, viz:

For the year	1879, from	0 members	
" "	1880, "	2 "	$10 00
" "	1881, "	6 "	30 00
" "	1882, "	19 "	95 00
" "	1883, "	92 "	460 00
" "	1884, "	294 "	1,470 00
" "	1885, "	524 "	2,620 00
" "	1886, "	1,086 "	5,430 00
		2,023	$10,115 00

Your Committee find—

For the year	1879, from	2 members	$10 00
" "	1880, "	3 "	15 00
" "	1881, "	9 "	45 00
" "	1882, "	21 "	105 00
" "	1883, "	102 "	510 00
" "	1884, "	296 "	1,480 00
" "	1885, "	530 "	2,650 00
" "	1886, "	1,072 "	5,360 00
		2,035	$10,175 00

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* All these gentlemen became members by signing the Constitution as delegates. The list had been made out for publication with the Minutes, but its loss was not discovered in time. The name of Dr. A. B. Lyons is reported on page 22, Proceedings 1885.—SECRETARY.

The Committee's finding	2,035	members
" Treasurer's report	2,023	"
" difference	12	"

This difference of 12 members is equivalent to	$60 00
which with a clerical error of	10 00
in the same report affects the prospective assets as reported by the Treasurer to the amount of	$70 00

With the exception of differences noted, your Committee find the annual report of the Treasurer correct.

Your Committee would further report that they find entered on the cash book as received by the Treasurer from July 1, 1886, to the end of his official year, the sum of $2,190 00

They also find as paid out during the same time to George W. Kennedy the sum of $111 47

The following is a statement as to the cash balance at the close of the Treasurer's official year according to the findings of your Committee; also a statement of the amount handed over by the late Treasurer:

Cash balance reported by the Treasurer	$4,501 09
Less life-membership fee from E. C. Jones, omitted on Treasurer's statement as above mentioned	40 00
	$4,461 09
Cash received between July 1, 1886, and the end of the Treasurer's official year	2,190 00
	$6,651 09
Cash paid out during same time	111 47
Cash balance according to the findings of your Committee	$6,539 62

Your Committee find deposited in the New England Trust Co., Boston, Mass., being amount handed over by the late Treasurer $6,568 97

Recapitulation.

Amount on deposit	$6,568 97
Cash balance according to findings of your Committee	6,539 62
Over deposit	$29 35

The attention of your Committee has been particularly called by the Council to the differences in the printed Proceedings for some years past, between the number of new members as reported by the Treasurer and the number as reported by the Committee on Membership, with a view of ascertaining the real facts. In the investigation necessary to accomplish this, your Committee found it necessary to carefully examine all the accounts of the Treasurer, commencing with the year 1879, and we submit for your consideration the result of examinations made by a skilled accountant employed by authority of the Council.

In the Proceedings of 1880, page 517, the Committee on Membership reports 86 new members elected in 1879.

In the same Proceedings, page 525, the Treasurer reports receiving membership fees from 55 new members. Your Committee find that there were elected in 1879, 86 new members.

Of these, 57 appear on both cash-book and ledger; 24 appear on the ledger, but not on the cash-book, and 5 do not appear to have any account on the ledger, nor do any payments from them appear on the cash-book. The names of these five persons are as follows: A. J. Inloes, Binghampton, N. Y.; C. M. Lyman, J. Rieffenstahl, Buffalo, N. Y.; H. A. Mott, New York City; H. P. Napier, Oswego, N. Y.

In the Proceedings of 1881, page 495, the Committee on Membership reports 176 new members elected in 1880. In same proceedings, page 514, the Treasurer reports receiving membership fees from 145 new members.

Your Committee find that there were elected in 1880, 175 new members. Of this number, 152 appear on both cash-book and ledger; 17 appear on the ledger, but not on the cash-book, and 6 do not appear to have any account on the ledger, nor do any payments from them appear on the cash-book. The names of these 6 persons are as follows, viz: R. M. Carlton, Somersworth, N. H.; I. H. Hubacheck, Rochester, N. Y.; E. W. Morse, Oswego, N. Y.; D. C. Packard, Watertown, N. Y.; G. S. Page, New York City; M. W. Parsons, Towanda, Penna.

Your Committee also here discover that Mr. Grenville M. Baker, Brooklyn, N. Y., does not appear to have been elected, but that he paid ten dollars ($10.00) Sept. 14, 1880, and continued to pay annual dues until his death.*

This may account for the difference between the findings of your Committee and the report of the Committee on Membership.

In the Proceedings of 1882, page 610, the Committee on Membership reports 147 new members elected in 1881. In the same Proceedings, page 609, the Treasurer reports receiving membership fees from 122 new members.

Your Committee find that there were elected in 1881, 149 new members. Of this number, 126 appear on both cash-book and ledger; 17 appear on the ledger, but not on the cash-book, and 6 do not appear to have any account on the ledger nor do any payments appear from them on the cash-book. The names of these 6 persons are as follows, viz: B. Bantly, Milwaukee, Wis.; W. A. Dieterrich, New York City; N. A. McCallum, Strong, Kas.; G. D. McKensie, Detroit, Mich.; F. Reed, Natick, Mass.; W. H. Woodman, Danvers, Mass.

The difference between the figures of the Committee on Membership, 147, and the findings of your Committee, 149, is explained by the fact that 2 delegates, viz: James Foulke, of Jersey City, N. J., and H. M. Pettit, Carrollton, Mo., became members without their names passing through the hands of the Committee on Membership, nor do their names appear in the printed Proceedings as having been elected in 1881.†

In the Proceedings of 1883, page 426, the Committee on Membership reports 128 new members elected in 1882. In the same Proceedings, page 437, the Treasurer reports receiving membership fees from 120 new members. Your Committee find that there were

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* Mr. Baker was present as delegate at the meeting in 1880; but sent in his signature to the Constitution and By-Laws after the publication of the Proceedings.—SECRETARY.

† Mr. Pettit had signed the Constitution as a delegate, but the Secretary was not informed of the payment of dues until the Proceedings had been published. Mr. Foulke sent in his signature afterwards.—SECRETARY

elected in 1882, 129 new members; of this number, 125 appear on both cash-book and ledger, and 4 do not appear to have any account on the ledger, nor do any payments from them appear on the cash book. The names of these four (4) persons are as follows, viz: J. C. Chapman, Newburgh, N. Y.; Julius Imgard, New York City; Bernard Osann, New York City; D. R. Noyes, St. Paul, Minn.

The difference between the figures of Committee on Membership, 128, and the findings of your Committee, 129, is explained by the fact that a delegate, H. W. Cole, Danville, Va., became a member without his name passing through the hands of the Committee on Membership, nor does his name appear in the printed Proceedings as having been elected in 1882.*

In the Proceedings of 1884, page 489, the Committee on Membership reports 90 new members elected in 1883. In the same Proceedings, page 524, the Treasurer reports receiving membership fees from 94 new members. Your Committee find that there were elected in 1883, 93 new members; all of these appear on both cash book and ledger.

The difference between the figures of the Committee on Membership, 90, and the findings of your Committee, 93, is explained by the fact that two (2) delegates, H. A. Johnstone, of Washington, D. C., and E. P. Galt, Selma, Ala., became members without their names passing through the hands of the Committee on Membership, nor do their names appear in the printed proceedings as having been elected in 1883, and by the fact that it is here discovered that Mr. S. C. Durban, of Augusta, Ga., does not appear to have been elected, but that he paid ten dollars ($10.00) June 16, 1884.†

In the Proceedings of 1885, page 529, the Committee on Membership reports 40 new members elected in 1884; in the same Proceedings, page 546, the Treasurer reports receiving membership fees from 45 new members. Your Committee find that there were elected in 1884, 42 new members; all of these appear on both cash-book and ledger.

The difference between the figures of the Committee on Membership, 40, and the findings of your Committee, 42, may be explained by the fact that a delegate, A. P. Cunningham, of Champaign, Ill., became a member without his name passing through the hands of the Committee on Membership, nor does his name appear in the printed Proceedings as having been elected in 1884, and by the fact of restoration to membership of T. H. Patterson, Chicago, Ill.‡

RECAPITULATION.

Elected in the year	Reports of the Committee on Membership.			Reports of the Treasurer.			Findings of your Committee.
	Proceedings.	Page.	New Members	Proceedings.	Page.	New Members	New Members.
1879 . .	1880	517	86	1880	525	55	86
1880 . .	1881	495	176	1881	514	145	175
1881 . .	1882	610	147	1882	609	122	149
1882 . .	1883	426	128	1883	437	120	129
1883 . .	1884	489	90	1884	524	94	93
1884 . .	1885	529	40	1885	546	45	42

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* Mr. Cole signed as a delegate after the Proceedings had been published.—SECRETARY.

† Mr. Durban signed as a delegate after the Proceedings had been published.—SECRETARY.

‡ Mr. Cunningham signed the Constitution as a delegate, and his name appears on the roll of members for 1884, but was accidentally omitted from page 541. He omitted to sign the register of attendance, hence his name does not appear on page 22, Proceedings of 1884.—SECRETARY.

Your Committee would call the attention of Council to the fact that, in our examination of the differences between the reports of the Treasurer and the reports of the Committee on Membership, we have been enabled to account for the differences between the statements of the Committee on Membership and our findings, but we could not come to anything like a satisfactory conclusion with reference to the reports of the Treasurer.

The accountant also finds that in the years 1879, 1880, and 1881, there appears to have been received (by the ledger) from 58 new members a sum amounting to $720 (see Schedule A), for which there are no corresponding entries on the cash-book.

He finds, likewise, credits on the ledger and not on the cash-book, dues for the year 1880 from 129 members, for the year 1881 from 128 members, for the year 1882 from 24 members, for the year 1883 from 3 members, and for the year 1884 from 1 member; total, 285 members at $5.00, $1,425.00. (See Schedule B.)

He finds, likewise, a credit to L. R. Blackman of life membership fee paid in 1880, which does not appear in the cash-book, $50.00.

The accountant also finds *credit* entries on cash-book, and not posted on the ledger, amounting to four hundred and seven dollars and fifty cents, $407.50. (See Schedule C.)

RECAPITULATION.

Apparent Debits.

From new members, Schedule A	$720 00
On ledger but not on cash-book, Schedule B	1425 00
Life membership fee, L. R. Blackman	50 00
	$2195 00

The following number of new members not appearing on either cash-book or ledger:

For 1880	5	?
1881	6	?
1882	6	?
1883	4	?
		?

Apparent Credits.

On cash-book, but not on ledger, Schedule C	$407 50

In view of the condition of the accounts of the Association, as shown by the facts already reported, your Committee found it absolutely necessary to send a statement to each member, of his account as it appeared on the books of the Association.

Your Committee were flooded with the replies sent in from these statements of accounts. A large portion of these replies disputed the correctness of the accounts of their writers, as shown by the books. From back receipts shown, from satisfactory evidence through the local agents of the Association, and from other reliable information received, your Committee are convinced, beyond a reasonable doubt, that the following named members should receive additional credit on the books of the Association for the years set against their names, and respectfully recommend that the Council order their accounts adjusted accordingly. Their names and dates here follow:

Hazen W. Adams	1886	$5 00
Andrew M. Armstrong	1877	5 00
John H. Asplin	1884, '85	10 00
Charles Becker	1884	5 00
Emil L. Boerner	1882, '83, '84	15 00

John B. Bond	1886	$5 00
Henry A. Borell	1885	5 00
George W. Boyd	1885	5 00
Albert B. Buck	1884	5 00
Edward S. Burnham	1885	5 00
James W. Caldwell	1881, '82	10 00
Samuel Campbell	1884	5 00
Charles Christiani	1884, '85	10 00
Thomas P. Cook	1882, '83	10 00
James C. DeCou	1885	5 00
J. M. Delavallade	1884, '85, '86	15 00
Chas. L. Eberle	1884	5 00
Columbus V. Emich	1885	5 00
William Fisher	1884	5 00
Peter P. Fox	1884	5 00
Edward P. Galt	1886	5 00
Frederick L. Gegelein	1885	5 00
Samuel Gerhard	1883, '84	10 00
George W. Glines	1885, '86	10 00
John E. Grove	1886	5 00
Louis A. Haber	1883, '84	10 00
Henry Hawkins	1881, '82	10 00
Charles Holzhauer	1877	5 00
Lewis C. Hopp	1884	5 00.
Wm. H. Hyler	1884	5 00
J. B. H. Jefferson	1884	5 00
Harry A. Johnston	1884, '85	10 00
Louis Keiper	1883	5 00
Gustavus A. Knabe	1885	5 00
Lewis T. Lazell	1886	5 00
James A. Lee	1886	5 00
Louis Lehn	1885	5 00
Abraham L. Lengfeld	1886	5 00
J. C. Loomis	1886	5 00
George B. Lockhart	1884	5 00
Alfred Mayell	1884	5 00
Byron F. McIntyre	1882, '83, '84	15 00
John A. Milburn	1885	5 00
Washington C. Milburn	1885	5 00
Edward L. Milhau	1884	5 00
R. McC. Miller	1884	5 00
W. J. Morley	1886	5 00
Talbot C. Murray	1885	5 00
Charles F. Panknin	1886	5 00
Edward T. Pettengill	1884, '85	10 00
H. M. Pettit	1883, '84	10 00
Gustavus Pfingsten	1884	5 00
Charles F. Rickey	1886	5 00
Theodore Ronnefeld	1880, '81	10 00
George M. Schambs	1884, '85, '86	15 00
John P. Scherff	1885	5 00

Henry J. Schlaepfer	1886	$5 00
F. L. Slocum	1884	5 00
Henry C. Schranck	1884, '85	10 00
Geo. J. Seabury	1885	5 00
Giles G. C. Simms	1885	5 00
C. E. Sitton	1886	5 00
J. E. Sombart	1883, '84, '85	15 00
P. I. Spenzer	1883, '84, '85	15 00
E. C. Stanley	1885	5 00
William S. Thompson, Washington	1885	5 00
Frank M. Tiernan	1884	5 00
Jacob P. Urban	1885, '86	10 00
R. W. Vandervoort, estate of	1885	5 00
J. R. Walton	1885	5 00
John A. Webb	1885	5 00
William H. Webb	1884, '85, '86	15 00
Thomas M. Wehrly	1884, '85	10 00
Nelson S. Whitman	1885	5 00
John K. Williams	1885	5 00
E. C. Winslow	1886, '87	10 00
George A. Zwick	1885	5 00
		$535 00

Your Committee respectfully recommend that all further accounts found on the ledger, showing credits for dues omitted, and yet showing credits for later years' dues, be considered as having been paid in full to date of last payment; and the Committee further recommend that all outlawed accounts appearing on the ledger be balanced, "by order of the Council."

To make it entirely plain to the new Treasurer, and as a matter to be placed upon record, we offer the following:

WHEREAS, Some of the accounts on the ledger of the Association, kept by the late Treasurer, are in a confused condition, your Committee feel unwilling to assume the authority of closing them and transferring them to the new ledger, to be kept by the present Treasurer, and therefore they recommend that satisfactory information being received that the dues for any particular year are paid shall be considered a receipt in full, up to and including said year, and the account be balanced accordingly, and that the following entry be made in each such account, viz: "By dues, by order of Council."

The following named members desire, on account of present embarrassments, to have further time given them in which to pay up their dues, not wishing to be dropped from the roll, viz.: Peter P. Fox, Charles C. Martin, Francis M. Murray.

Your Committee recommend that further time be granted them.

Your Committee find that the following names appear on the printed list of members for 1885, but find no corresponding accounts on the books of the late Treasurer, viz: Isaac C. Chapman, Julius Imgard, George D. MacKimmie, Bernard Osann.

Letters were sent to their addresses, as appearing on the printed list, and, after ample time, no replies have been received. Your Committee recommend that no accounts be opened with the parties, and that their names be dropped from future lists.

Your Committee find, on satisfactory evidence submitted, that the following named members are entitled to copies of the Proceedings for the years set against their names, and respectfully recommend that copies be furnished them accordingly,* viz:

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* These volumes have been delivered.—SECRETARY.

J. M. Delavallade, 1885 and '86.
John E. Grove, 1886.
John Hurley, 1884.
W. H. Hyler, 1883 and '84.
L. Keiper, 1883.
O. M. Oleson, 1884.
E. A. Schellentrager, 1885.
C. M. Trask, 1878.
John A. Webb, 1885.

From evidence submitted, your Committee further find that the following named gentlemen are entitled to their resignations or honorable discharge, to date from year set opposite their names, viz:

Henry Bodeker, 1884.
A J. Broughton, 1884.
Robert H. Cowdrey, 1886.
E. G. Frothingham, 1886.
Horace J. Johnson, 1883.
Robert M. Kuerze, 1886.
L. Keiper, 1883.
A. L. Lengfeld, 1886.*
W. W. Moorhead, 1885.
Frederick Nick, 1884.
E. Walton Russell, 1884.
E. E. Shead, 1886.
J. W. Stanford, 1883.
W. M. Townley, 1886.
G. F. Underhill, 1884.
E. J. Williamson, 1886.
L. Wolff, 1886.
M. R. Zaegel, 1884.

Your Committee recommend that said resignations be granted.

The attention of the Council is called to the fact that the statements sent to the following named members, as per printed list, were returned by the Postal Department as "not found," viz:

John W. Beebe, Cincinnati, O.
David P. Cox, Terre Haute, Ind.
Chambers B. Clapp, Chicago, Ill.
George F. Dinsmore, Boston, Mass.
George B. Frazee, Denver, Col., and Richmond, Va.
Chas. J. V. Fries, Anoka, Miss.
Dominicus Hanson, Rochester, N. Y.
Stuart W. Johnson, Chicago, Ill.
John H. Lawrence, North Andover, Mass.
Samuel L. Ramsey, Orange, N. J., and Brooklyn, N. Y.
Frederick Schuerman, Cincinnati, O.
F. L. Slocum, Pittsburgh, Pa.†
Wm. T. Thackeray, Davenport, Ia.
George Walker, Girard, Kan.‡
Albert Weiser, St. Paul, Minn.
John L. Zimmerman, Searcy, Ark.||

Your Committee call the special attention of the Council to letters from J. M. Delavallade and Samuel W. Winslow, on requests for life membership, without further comment. Attention is also called to letter from G. T. Chamberlain, whose account appears on the ledger as having paid up to 1882, but also as having relinquished his claim to life membership under the old system. Mr. Chamberlain claims to have been returned to life membership in 1883. If such is found to be the case, the Committee recommend that his account be balanced accordingly.

All the letters received by the Committee, bearing on its work, accompany this report. They are placed in appropriate files, each file bearing a label on its face, showing the

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* Mr. Lengfeld has withdrawn his resignation.—SECRETARY.

† Resides in Allegheny City, Pa.—SECRETARY.

‡ Weir, Kan., on roll of members, 1886.—SECRETARY.

|| Removed to Las Vegas, N. Mex.—SECRETARY.

character of its papers. These letters alone may give the Council perhaps a faint idea of the magnitude of the labor involved. Very many of these letters required detailed replies, as may be readily inferred from reading them. From the nature of the work, it could not be done at one or two sittings; but, as the work progressed, your Committee met from time to time, as best the members could be spared from their business. Though not a congenial task, it has been carefully and searchingly performed.

Finally, your Committee respectfully recommend that the books of the late Treasurer be balanced in accordance with the foregoing findings, previous to handing them over to the present Treasurer of the Association.

All of which is respectfully submitted,

JOS. L. LEMBERGER,
HENRY CANNING,
LINUS D. DRURY,
Auditing Committee.

The following resolutions were passed by Council by correspondence:

February 21, 1887. On motion of George W. Kennedy, seconded by Wm. S. Thompson.

Resolved, That the report of the Auditing Committee appointed by the Council at Providence, R. I., consisting of Jos. L. Lemberger and two others whom he should select, be received and its recommendations adopted, and that the said committee be and they are hereby empowered and instructed to carry said recommendations into effect on behalf of the Council.

April 26, 1887. On motion of J. M. Maisch, seconded by Wm. S. Thompson:

WHEREAS, Joseph L. Lemberger, Henry Canning, Linus D. Drury, active members of the American Pharmaceutical Association, have cheerfully, thoroughly, and without asking any recompense therefor, performed a very difficult, arduous and unpleasant duty or labor for the Association, acting as an Auditing Committee to examine and report as to the finances of the Association previous to the transfer of the accounts to the new Treasurer, therefore

Resolved, That Joseph L. Lemberger, Henry Canning and Linus D. Drury be and are made life members of this Association, and the Treasurer is instructed to transfer to the life membership fund the sum of one hundred and twenty dollars, said sum being the amount that said three members would, according to the by-laws, have to pay to become life members.

Resolved, That the Secretary of the Council send a copy of these resolutions to each of the said Lemberger, Canning and Drury, and also to the Treasurer.

May 16, 1887. On motion of W. S. Thompson, seconded by G. W. Kennedy,

Resolved, That the Treasurer be and is hereby directed to make a demand in writing on Mr. Chas. A. Tufts, late Treasurer of the American Pharmaceutical Association, for the sum of $2,195, the amount shown on page 9 of the printed report of the Auditing Committee to be due from him to said Association.*

Resolved, That if said Chas. A. Tufts fails to make a satisfactory settlement within thirty (30) days after the foregoing demand is made, the Chairman of the Council is authorized and directed to employ legal counsel and take such action in the premises as in his judgment will best protect the interests of the Association in the premises.

May 21, 1887. On motion of S. A. D. Sheppard, seconded by W. S. Thompson:

Resolved, That the Treasurer of the Association be instructed to arrange with some Insurance Company, which shall be satisfactory to the Finance Committee, for a bond of five thousand dollars as surety for said Treasurer, the bond to be deposited with the Chairman of the Council and paid for from the treasury of the Association.

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* The above amount was paid to Treasurer Sheppard previous to the annual meeting at Cincinnati.—SECRETARY.

May 21, 1887. On motion of W. S. Thompson, seconded by S. A. D. Sheppard,

Resolved, That Joseph L. Lemberger, Chas. A. Heinitsh, and Jacob H. Redsecker, be, and are hereby, appointed the Examining Committee provided for in paragraph 6, on page 686, Proceedings '86.

Resolved, That hereafter the Treasurer shall furnish with his annual report an alphabetical list of the names of the members from whom he has received dues, and subsequently a supplemental list to embrace like payments made between the close of the fiscal year and the adjournment of the annual meeting, for publication in the Proceedings.

August 18, 1887. On motion of W. S. Thompson, mover, seconded by G. W. Kennedy,

Resolved, That the sum of ten dollars is hereby appropriated to pay John J. Johnson, Esq., for legal services in advising the Chairman of the Council as to the legal rights of the Association against Chas. A. Tufts.

SIXTH SESSION OF COUNCIL, GRAND HOTEL, CINCINNATI, SEPTEMBER 4.

(10 members present.)

A communication from Mr. B. Lillard was received, requesting permission to be present at the Council meetings, as the representative of the "Druggists' Circular."

On motion of Mr. Menninger, it was

Resolved, That representatives of pharmaceutical journals be invited to attend the Council meetings.

The report of the Committee on Membership was read, accepted, and referred to the Association.

Mr. Ebert moved to amend Chap. V., Art. 2, of the By-Laws of the Council, by striking out the closing sentence, commencing, "and may select."

SEVENTH SESSION, GRAND HOTEL, SEPTEMBER 5. (13 members present.)

The applications of 31 candidates for membership were examined, and referred to the Association.

The Secretary's report on Credentials was examined, and referred to the Association.

The Treasurer presented the following list of names, and recommended the acceptance of their resignations, to date from the year set opposite:

Chas. B. Allaire, Peoria, Ill., 1887.
Alvin B. Armstrong, Smethport, Pa., 1885.
J. W. Bassett, Tompkinsville, N. Y., 1886.
D. P. Cox, Terre Haute, Ind., 1885.
E. Eareckson, Baltimore, Md., 1885.
G. W. French, Boston, 1887.
M. Gessler, Milwaukee, 1886.
J. R. Gorham, Newburgh, N. Y., 1886.
Dom. Hanson, Rochester, N. Y., 1886.
Wm. H. Harbers, Aiken, S. C., 1887.
F. L. Harwood, Warren, Mass., 1886.
H. W. Heuermann, Chicago, 1886.
C. H. Hobart, New York, 1887.
C. M. Hostetter, Pittsburg, 1886.
J. F. Hurt, Columbia, Mo., 1885.
J. B. H. Jefferson, Baltimore, 1886.
B. F. Johnson, Philadelphia, 1886.
Thos. Kennedy, New Brighton, Pa., 1886.
R. Lautenbach, Baltimore, 1886.
S. E. Lewis, Washington, D. C., 1884.
W. S. Milliner, Spencerport, N. Y., 1887.
J. S. Moore, West Stockbridge, Mass., 1885.
J. B. Purcell, Richmond, Va., 1887.
Aug. Schreiber, Tell City, Ind., 1884.
J. W. Snow, Boston, 1886.
Abner Thorp, Avondale, O., 1886.
Wm. P. Thompson, Baltimore, 1883.
Ph. A. White, New York, 1886.
C. R. Wigert, Burlington, Ia., 1884.
S. W. Winslow, Boston, 1886.
T. J. Wrampelmeier, San Diego, Cal., 1886.

On motion of Mr. Menninger, the resignations were accepted; but Mr. Allaire was requested to withdraw his resignation.*

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* The request was declined.—SECRETARY.

The Treasurer also presented a list of members who are liable to be dropped from the roll for non-payment of dues for three or more years. The list was laid on the table for future action.

On motion of the Treasurer, the resignations of the following members were accepted and their dues remitted :

Chas. M. Helman, Cincinnati.	A. T. Pinkham, Dover, N. H.
Geo. Y. Miller, Luzerne, N. Y.	T. J. Savage, Mobile, Ala.

The following members, who had relinquished their right to life membership years ago, were, on motion of Mr. Sheppard, made life members, old style, without claim on the Proceedings:

M. F. Ash, Jackson, Miss.	T. S. Wiegand, Philadelphia.

Rule V. of the General Rules on Finance was amended, on motion of Mr. Sheppard, by adding the words " who shall make an annual report of the same to the Association."

The opinion of J. J. Johnson, Esq., attorney-at-law, in relation to the discrepancies in the accounts of the former Treasurer, C. A. Tufts, was presented and ordered to be filed.

A bond from the Guarantee Company of North America, on behalf of S. A. D. Sheppard, Treasurer, in the sum of $5000, was presented, accepted, and turned over to the Chairman of Council as the proper custodian.

The report of the Committee on Publication in relation to the proposed printing of papers previous to the meetings was read and referred to the next Council.

On motion of Mr. Diehl, Mr. Emlen Painter was authorized to distribute to the members of the Association previous to reading the papers, such printed copies as he had prepared.

The engagement of Dr. C. R. Morgan as a stenographer at an expense of $150 was approved.

The following reports were read and referred, and the recommendations of the Treasurer and Auditing Committee approved relating to the account of the Committee on Arrangements.

REPORT OF THE TREASURER OF THE AMERICAN PHARMACEUTICAL ASSOCIATION FOR THE YEAR ENDING JUNE 30, 1887.

RECEIPTS.

Balance on hand September 9, 1886, being the cash received from the late Treasurer, Chas. A. Tufts		$6568 97
Received from 28 new members for membership fees	$140 00	
Received from 2 members for life membership fees	100 00	
Received from the sale of 6 certificates	32 50	
Received from the sale of Proceedings	102 05	
Received from the Centennial Fund	44 05	
Received from Interest on Deposit in the New England Trust Company, Boston, Mass	118 80	
Received from Committee on Arrangements	429 77	
Received from annual dues	5740 00	
		6707 17
Total receipts		$13276 14

DISBURSEMENTS.

1886.			
September	27.	Check No. 1. C. Lewis Diehl, salary as Reporter of the Progress of Pharmacy, September 1885 to September 1886	$750 00
		Check No. 2. George W. Kennedy, salary as Secretary of Council, and as Chairman of Committee on Membership, September 1885 to September 1886	200 00
		Check No. 3. John M. Maisch, sundry expenses	39 01
		Check No. 4. Cyrus R. Morgan, services as Stenographer at the Providence Meeting	100 00
		Check No. 5. Charles Rice, Centennial Fund	34 05
		Check No. 6. Blackstone Hall Company, use of Blackstone Hall, Providence, R. I	80 00
		Check No. 7. J. A. and R. A. Reid, printing	4 00
		Check No. 8. John M. Maisch, expenses of attendance at Providence Meeting	31 25
	30.	Cash. Life Membership Fund, Charles Holzhauer and John H. Winkleman	100 00
October	9.	Check No. 9. William B. Blanding. expense of room at hotel in Providence for use of Council and Committees	22 50
		Check No. 10. Life Membership Fund, by special vote of Council at Providence	3000 00
	19.	Check No. 11. Lyman B. Brooks, making two special check books, 600 checks in each	23 00
	27.	Check No. 12. Constantin Schmidt, Centennial Fund	10 00
December	3.	Check No. 13. J. B. F. Shedd, services as Expert Accountant, employed by Auditing Committee	135 00
December	4.	Check No. 14. Winkley, Dresser & Co., printing and stationery	53 47
	13.	Check No. 15. Inquirer Printing and Publishing Company, Proceedings	107 25
1887.			
March	21.	Check No. 16. F. Gutekunst, portrait for Proceedings	61 12
		Check No. 17. Henry Canning, expenses of Auditing Committee	24 94
		Check No. 18. Inquirer Printing and Publishing Company. Proceedings	1699 66
		Check No. 19. John M. Maisch, sundry expenses.	298 83
		Check No. 20. Standard Publishing Co., printing	22 75
		Check No. 21. George W. Kennedy, sundry expenses	3 26
		Check No. 22. Mills, Knight & Co., account books, stationery and printing.	105 00
		Check No. 23. Frank Wood, printing and stationery	16 25
		Check No. 24. Winkley, Dresser & Co., printing and stationery	37 18
	31.	Check No. 25. Gibson Brothers, printing	19 25
April	11.	Check No. 26. Henry Canning, expenses of Auditing Committee	11 30
	12.	Check No. 27. John M. Maisch, insurance on property of Association.	15 00

May	17.	Check No. 28. Life Membership Fund, by special vote of Council, on account of Auditing Committee	$120 00
	28.	Check No. 29. Stettiner, Lambert & Co., circulars for Formulary Committee	33 25
June	20.	Check No. 30. Winkley, Dresser & Co., printing and stationery	29 25
		Check No. 31. S. A. D. Sheppard, sundry expenses	20 13
		Check No. 32. S. A. D. Sheppard, salary, Sept., 1886, to Sept., 1887	600 00
		Check No. 33. John M. Maisch, salary, Sept., 1886, to Sept., 1887	750 00
		Total disbursements	$8556 70
	30.	Cash on hand, balance to new account	4719 44
			$13276 15

The Treasurer further reports that he has credited the following amounts on the Association Ledger as "*By Order of Council:*"

Charles P. Aimar	'85	$5 00
Willis Benedict	'85	5 00
Charles Beyschlag	'84 '85	10 00
J. Kellar Burns	'86, '87	10 00
Edward B. Bury	'85	5 00
Oscar H. Coumbe	'85	5 00
Zachariah W. Cromwell	'85	5 00
Walter G. Duckett	'85	5 00
Charles E. Eberle	'85	5 00
Augustus W. Eckel	'85	5 00
Henry C. Gaylord	'85	5 00
William B. Haight	'86	5 00
George L. Hechler	'84	5 00
Luther L. Jenkins	'86	5 00
Amount carried forward		$80 00
Amount brought forward		$80 00
Gustavus J. Luhn	'85	5 00
John R. Major	'85	5 00
George L. Marsteller	'85	5 00
Ashbel H. Merrell	'86	5 00
Charles O. Michaelis	'85	5 00
Daniel Myers	'84	5 00
Arthur Nattans	'85	5 00
Richard Parsons	'84	5 00
Nathan Rosenwasser	'84	5 00
Ernst A. Schellentrager	'84, '85	10 00
Frank W. Slosson	'84, '85	10 00
Albert Smithnight	'84	5 00
Robert H. Walch	'85	5 00
Total		$155 00

This was done in accordance with the vote of the Council adopting the recommendations of the Auditing Committee (Messrs Lemberger, Canning, and Drury) as found on page 12 of said Committee's printed report to the Council. (See p. 452 this volume.)

Satisfactory evidence had been received that the several amounts had been paid, and documents bearing on each case accompany this report.

The Treasurer has learned that in several cases a part or the whole of the amount shown by members to have been paid—see report of Auditing Committee—and therefore allowed by the Council, was in the hands of an agent of the Association.

This money has now been received by the Treasurer from said agent, and a memorandum to that effect has been made on the books of the Association.

The several cases above referred to are as follows:

John H. Asplin	'84 and '85	$10 00
F. L. Gegelein	'85	5 00
George W. Glines	'86	5 00
Louis Haber	'84	5 00

Geo. M. Schambs	'85 and '86	$10 00
P. I. Spenzer	'84 and '85	10 00
J. P. Urban	'86	5 00
Total		$50 00

The following misprints or clerical errors were found in the report of the Auditing Committee (pages 10, 11, 12.)*

Edward S. Burnham	1886 should be	1885
Columbus V. Emich	1887 "	1885
Louis Lehn	1886 "	1885
George J. Seabury	1886 "	1885
George A. Zwick	1886 "	1885
R. W. Vandervoort	1886 "	1885
P. I. Spenzer	'82, '83, '84 should be	'83, '84, '85

In the account of receipts is an item of $429.77 received from the Committee on Arrangements. This includes the balance of $299.12 left over in 1883—see Proceedings, 1884, page 531—and $130.65, the amount left over at the Providence meeting in 1886.

It would seem proper that this money be placed to the credit of an account which should be opened by the Treasurer and styled the account of Committee on Arrangements.

Accompanying this report is an alphabetical list of the names of members from whom money has been received for annual dues, membership fees, or certificates, previous to July 1, 1887.†

S. A. D. SHEPPARD, *Treasurer.*

Boston, July 1, 1887.

LEBANON, JULY 12, 1887.

TO WM. S. THOMPSON, ESQ., CHAIRMAN OF THE COUNCIL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

The committee appointed by the Council to examine the books, accounts, vouchers, etc., etc., belonging to the Treasurer, the bonds, savings bank books, etc., in the hands of the Chairman of Council, representing the several funds of the Association, met pursuant to a call by the Chairman at the Eagle Hotel, in the city of Lebanon, Pa., on Monday, July 11, 1887, and after a careful examination of all the books of the Treasurer, viz., the bank book, account with N. E. Trust Co., Boston, Mass., the cash book, ledger, and book containing the various funds, named as follows, viz.; The Ebert Fund, the Centennial Fund, the Life Membership Fund, and making a comparison with bills, vouchers and check book, and exhibit or statement, accompanying the Treasurer's effects, we beg to offer the following:

We find the report of Treasurer Samuel A. D. Sheppard correct, and his books in a condition to be readily comprehended.

The receipts from all sources, including the amount of six thousand five hundred and sixty eight dollars and ninety-seven cents, $6568.97, received from the late Treasurer Chas. A. Tufts, were thirteen thousand two hundred and seventy-six dollars and fourteen cents		$13276 14
The disbursements covered by orders beginning with No. 320 and ending with No. 352, and paid by checks No. 1 to No. 33 inclusive, amount to eight thousand four hundred and fifty-six dollars and seventy cents	8456 70	

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* These and a few other misprints have been corrected in the report as printed on pages 446–452.—SECRETARY.

† This list is printed following the minutes.—SECRETARY.

Amount carried to Life Membership Fund for Chas. Holzhauer, John H. Winkelman	100 00	
		8556 70
Leaving a balance of four thousand seven hundred and nineteen dollars and fourty-four cents		$4719 44

This balance we find to the credit of the American Pharmaceutical Association in the bank book in account with the New England Trust Company, Boston, Mass.

Your Committee also find due the Association by members as annual dues the sum of seven thousand two hundred and sixty dollars, $7260.00, which sum does not appear to be as large as the reported amount last year. Your Committee has prepared an alphabetical list of this item, which will in all probability require the action of Council, with special reference to the large arrearage on the part of some of the members.

We draw your attention to the difference between the amount reported as being on hand by the late Treasurer Charles A. Tufts, in his report read at the meeting in Providence, which was six thousand five hundred and forty-four dollars and sixty-two cents, $6544.62, and the amount reported as having been received by the present Treasurer from Mr. Tufts, which when transferred amounted to six thousand five hundred and sixty-eight dollars and ninety-seven cents, $6568.97.

We find the various funds of the Association to be as follows, viz.:

The Ebert Fund, which consists of the following:

1 U. S. Registered 4 per cent. Bond, $100.00 No. 160,603	$128 25
1 " " " " 500.00 " 67,880	641 25
Deposit in the Savings Bank of the county of Strafford, Dover, N. H., as per book, No. 19,409	32 96
Total value	$802 46

The Centennial Fund consists of the following, viz:

One (1) U. S. Reg. 4% Bond, $1000.00, No. 145,640	$1282 50
One (1) " " $100.00, No. 160,604	128 25
Deposit in the Savings Bank of the County of Strafford, at Dover, N. H., as per book No. 19,410	37 63
Total value	$1448 38

The Life Membership Fund consists of the following, viz:

One (1) U. S. Reg. 4% Bond, $1000.00, No. 145,639	$1282 50
One (1) " " 1000.00, No. 145,761	1282 50
One (1) " " 1000.00, No. 145,762	1282 50
One (1) " " 100.00, No. 160,605	128 25
One (1) " " 100.00, No. 160,606	128 25
One (1) " " 100.00, No. 160,711	128 25
One (1) " " 100.00, No. 160,712	128 25
One (1) " " 100.00, No. 160,713	128 25
One (1) " " 100.00, No. 160,714	128 25
One (1) " " 100.00, No. 162,830	128 25
Deposit in the Savings Bank for the County of Strafford, Dover, N. H., Book No. 19,411	125 20
Total value	$4870 45

We find an item in the Treasurer's report of four hundred and twenty-nine dollars and seventy-seven cents ($429.77) received as balances from several Committees on Entertainment. In his report the Treasurer recommends that this money be placed to the credit of an account which should be opened by the Treasurer, and styled "The Account of the Committee on Arrangements," and your Committee deem this of sufficient importance to respectfully draw the attention of the Council to the matter.

The value of the U. S. bonds contained in the report was based upon the market quotations on July 1, 1887.

Your Committee were steadily engaged for nearly three days in making this examination, and they cannot conclude their report without testifying their appreciation of the painstaking care exhibited by Treasurer Sheppard, as evidenced by the neatness and accuracy which pervades all the details of his work.

Respectfully submitted,
JOS. L. LEMBERGER,
CHARLES A. HEINITSH,
J. H. REDSECKER,
Examining Committee.

To the Council of the American Pharmaceutical Association:

GENTLEMEN—The following is a statement of the several Invested Funds belonging to the Association for the financial year July 1, 1886, to July 1, 1887.

Submitted by
W. S. THOMPSON,
Chairman of the Council.
Washington, D. C., July 1, 1887.

EBERT FUND.

This fund was invested July 1, 1886, as follows:

$100.00 United States Reg. 4 per cent. Bond No. 127,868	$126 25
$100.00 " " " " No. 127,869	126 25
$100.00 " " " " No. 127,870	126 25
$100.00 " " " " No, 127,871	126 25
$100.00 " " " " No. 138,629	126 25
$100.00 " " " " No. 158,579	126 25
Deposit in the Savings Bank for the County of Strafford, Dover, N. H., as per book No. 19,409	14 63
	$772 13

The above-named securities were in the name of Charles A. Tufts, Treasurer.

Additions to the Fund During the Year.

Interest on the United States Bonds October 1886, January and April 1887	$18 00
The interest on the United States Bonds received July 1886 was reported last year, and therefore is not mentioned here.	
Interest on deposit in the Savings Bank	33
Advance in the market value of the United States Bonds	12 00

There have been no payments from this fund during the year.

This fund is invested July 1, 1887, as follows:

$500.00 United States Reg. 4 per cent. Bond No. 67,880	$641 25
$100.00 " " " " No. 160,603	128 25
Deposit in the Savings Bank for the County of Strafford, Dover, N. H., as per book No. 19,409	32 96
	$802 46

The above named securities are in the name of Samuel A. D. Sheppard, Treasurer.

CENTENNIAL FUND.

This Fund was invested July 1, 1886, as follows:

$500.00 United States Reg. 4 per cent. Bond No. 57,983	$631 25
500.00 " " No. 61,202	631 25
100.00 " " No. 155,998	126 25
Deposit in the Savings Bank for the County of Strafford, Dover, N. H., as per Book No. 19,410	47 62
	$1436 37

The above named securities were in the name of Charles A. Tufts, Treasurer.

Additions to the Fund During the Year.

Interest on the United States bonds October 1886, January and April 1887.	$33 00

The interest on the United States bonds received July 1886 was reported last year, and therefore is not mentioned here.

Interest on deposit in the Savings Bank.	1 06
Advance in the market value of the U. S. bonds.	22 00

Payments from the Fund During the Year.

Nov. 3, 1886.	For material used by Formulary Committee.	$10 00
May 13, 1887.	" " "	34 05
		$44 05

The Fund is invested July 1, 1887, as follows:

$1000.00 United States Reg. 4 per cent. bond No. 145,640	$1282 50
100.00 " " No. 160,604	128 25
Deposit in the Savings Bank for the County of Strafford, Dover, N. H., as per book 19,410	37 63
	$1448 38

The above named securities are in the name of Samuel A. D. Sheppard, Treasurer.

LIFE MEMBERSHIP FUND.

This Fund was invested July 1, 1886, as follows:

$100.00 United States Reg. 4 per cent. bond No. 127,872	$126 25
100.00 " " No. 127,873	126 25
100.00 " " No. 136,787	126 25
100.00 " " No. 136,788	126 25
100.00 " " No. 136,789	126 25
100.00 " " No. 137,239	126 25
100.00 " " No. 144,046	126 25
100.00 " " No. 150,258	126 25
100.00 " " No. 150,259	126 25
100.00 " " No. 150,260	126 25
100.00 " " No. 153,400	126 25
100.00 " " No. 158,580	126 25
Deposit in the Savings Bank for the County of Strafford, Dover, N. H., as per book No. 19,411	42 44
	$1557 44

The above named securities were in the name of Charles A. Tufts, Treasurer.

Additions to the Fund During the Year.

Interest on United States bonds; October 1886—January and April, 1887	$84 00

The interest on United States bonds received July 1, 1886, was reported last year, and therefore is not mentioned here.

Interest on deposit in Savings Bank	1 13
Life Membership Fee, Charles Holzhauer.	60 00
" John H. Winkelman.	40 00
Received from treasury of Association	3120 00
Advance in the market value of U. S. bonds	7 88

There have been no payments from this Fund during the year.

The Fund is invested July 1, 1887, as follows:

$1000.00	United States Reg.	4 per cent. bond	No. 145,639	$1282 50
1000.00	"	"	No. 145,761	1282 50
1000.00	"	"	No. 145,762	1282 50
100.00	"	"	No. 160,605	128 25
100.00	"	"	No. 160,606	128 25
100.00	"	"	No. 160,711	128 25
100.00	"	"	No. 160,712	128 25
100.00	"	"	No. 160,713	128 25
100.00	"	"	No. 160,714	128 25
100.00	"	"	No. 162,830	128 25
Deposit in the Savings Bank for the County of Strafford. as per book No. 19,411.				125 20
				$4870 45

These securities are in the name of Samuel A. D. Sheppard, Treasurer.

CINCINNATI, *September 5, 1887.*

TO THE MEMBERS OF COUNCIL OF AMERICAN PHARMACEUTICAL ASSOCIATION:

Gentlemen—Your Finance Committee report that they find the financial condition of our Association very satisfactory. In addition to the $3,000 placed into the Life Membership Fund there is a very comfortable balance, as will appear from the report of the Treasurer, after all the obligations of the Association have been paid so far as they have been duly presented for payment to the Treasurer. A large number of arrearages have been paid by the judicious management of our Treasurer.

A bond of the Guarantee Company of North America has been executed in favor of this Association by our Treasurer for the sum of $5,000.

There is an amount of $429.77 in the hands of the Treasurer, paid to him as balances from several Committees on Arrangement. In order to dispose of this amount for the purpose for which it was received, your Committee recommend that the Treasurer be authorized to open a "Committee on Arrangements Account" and credit this amount on the same as received October 23, 1886, and to which other similar balances shall be placed unless the Association should otherwise dispose of the money.

JOS. L. LEMBERGER,
W. S. THOMPSON,
A. H. HOLLISTER.

REPORT OF THE COMMITTEE ON PUBLICATION.

The Committee respectfully report that the resolution concerning the early publication of the Proceedings, which was passed at the last meeting, has been carried out; the whole of the Proceedings was printed and in the binder's hands before January 1st, and on January 13th and 14th they were all mailed to the members not in arrears or expressed to the authorized agents. The volume contains 773 pages, with nearly five hundred words of the larger type, and about nine hundred words of the smaller type on each page; the type-setting and printing had to be done in about eleven weeks, or on an average seventy pages had to be finished each week. This can only be accomplished by having all reports and papers ready at the meeting or within about a week after the close of the meeting. In accordance with the directions given by the Association last year, one or two papers had to be omitted from the printed records, since they did not arrive in time; in fact, have never been received by the Secretary. Portions of the different documents came to hand on October 6th, 7th, 9th, and 21st, but with the arrangement adopted no delay was occasioned thereby. One short report was received as late as December 13th, however, in time to find a place in the volume. The number printed was 1650 copies, and of the report on unofficinal formulas a sufficient number was printed separately for the use of that Committee.

The cost of publication was as follows:

Report on Unofficinal Formulas, electrotyping, printing, and binding.		$107 25
Proceedings, phonographic report	$100 00	
Composition, paper, and press-work	1379 46	
Phototype	61 12	
Binding and wrapping	315 00	
Freight	5 20	
		1860 78
Journals for use of Reporter for 1886	37 46	
1887	12 37	
		49 83
Other expenses of the Secretary, woodcuts	2 50	
Journal, one number	70	
Circulars	19 50	
Telegrams	61	
Envelopes and letter paper	16 00	
Packing boxes	3 05	
Freight and expressage	71 49	
Postage stamps	174 16	
		288 01
Salaries of Reporter and Secretary		1500 00
Total		$3805 87

The stock of Proceedings on hand and stored at the Philadelphia College of Pharmacy is as follows:

1851.	298	in paper.			
1852.	78	"			
1853.	78	"			
1854.	50	"			
1855.	93	"			
1857.	242	"	15	bound.	
1858.	54	"	1	"	130 loose.
1859.	—	"	32	"	
1860.	—	"	198	"	
1862.	—	"	271	"	
1863.	—	"	262	"	
1864.	175	"	109	"	
1865.	150	"	19	"	
1866.	67	"	73	"	
1867.	146	"	80	"	
1868.	52	"	145	"	
1869.	97	"	139	"	
1870.	108	in paper.	90	bound.	
1871.	96	"	55	"	
1872.	102	"	—	"	
1873.	16	"	95	"	
1874.	130	"	19	"	
1875.	54	"	52	"	
1876.	42	"	50	"	
1877.	48	"	89	"	
1878.	60	"	115	"	
1879.	22	"	95	"	
1880.	82	"	42	"	
1881.	51	"	31	"	
1882.	51	"	80	"	
1883.	44	"	134	"	
1884.	56	"	206	"	
1885.	113	"	242	"	
1886.	66	"	285	"	

Attention is again directed to the reduction of the price of the back volumes of the Proceedings, which the Committee hope will induce the members to complete their set of these publications, thus reducing the stock of books which have gradually accumulated.

The insurance on the above and other books remains the same as for a series of years past, it being $2500, in the German Fire Insurance Company of Philadelphia, at a premium of $15.

At the request of the librarian of the École supérieure de Pharmacie de Paris, the Committee decided to complete the set of Proceedings for that institution, since the volumes which were heretofore mailed annually to the Société de Pharmacie do not appear to be accessible. The books were recently shipped to their destination by the steamer Lord Clive, via Liverpool.

H. J. Menninger,
C. Lewis Diehl,
John M. Maisch.

REPORT OF THE COMMITTEE ON MEMBERSHIP.

To the Chairman and Members of the Council of the American Pharmaceutical Association.

Gentlemen: Your Committee on Membership, through its Chairman, have the honor of submitting this, their annual statement, for your kind consideration.

REPORT OF MEMBERSHIP.

Members in good standing at last report		1294
" elected at last meeting (1886)		28
Total membership		1322

LOSS IN MEMBERSHIP.

By resignation	11	
Dropped from roll for various causes	3	
By death	17	
Total loss		31
Number in good standing at this report		1291

HONORARY MEMBERSHIP.

Number on the roll at last report	26
Loss by death	1
Remaining at this report	25

After the unanimous adoption by the Council of Mr. Ebert's motion of January 28 1887, the chairman had 6000 blank applications printed and furnished them to members when wanted. P. W. Bedford obtained about 5000 and reports having distributed them in the following states: Massachusetts, New York, New Jersey, Pennsylvania, Wisconsin, Minnesota, California, Oregon, Louisiana, Georgia, and Alabama. Several members residing in Ohio obtained about 600 for circulation among the pharmacists in their state. In the mailing and distribution of the applications there was no expense incurred to the Association; the expense of printing was $19.00. Your Committee would also report that they had stereotype plates made for printing the applications, so that impressions can be made when needed. These plates can be used from year to year with very little alteration, and will effect considerable saving to the Association. The cost of the plates was $3.75.

At the proper time your Committee will present the names of a larger number of applicants for membership than were presented at the first session of last year.

I herewith present the names of 145 members who are in arrears with their dues, and who are liable to be stricken from the roll. I have every reason to believe that many on this list will pay up in time to obtain a copy of the next volume of the proceedings of the Association.

A number of our worthy associates and co-workers have been called to pay the debt of nature, and it becomes our painful duty to add their names to the long roll of those who have gone before. Their names are as follows. Some of these appear on the list of deceased members in the last proceedings:

Wm. C. Bakes, Philadelphia, Pa.; Lyman R. Blackman, Newport, R. I.; W. R. Campbell, Cumberland, Md.; Peter L. Dohmen, Milwaukee, Wis.; W. J. Earnshaw, Cambridge City, Ind.; Stanislas Martin, Paris, France; Oscar Monsarrat, Baltimore, Md.; Dillwyn Parrish, Philadelphia, Pa.; R. S. Priddy, Windsor, Ontario, Can.; Paul Reinlein, Washington, D. C.; Thos. Restieaux, Boston, Mass.; Herman F. Reum, Cincinnati, O.; Elijah Smalley, Boston, Mass.; Samuel F. Troth, Philadelphia, Pa.; Chas. G. Underwood, Boston. Mass.; R. W. Vandervoort, Newark, N. J.; Dr. G. C. Wittstein, Munich, Germany; J. W. Worthington, Moorestown, N. J.

Wm. C. Bakes, of Philadelphia, died on the 29th of August, 1886. Mr. Bakes was born in Liskard, England, and came to this country quite young, his father dying upon the vessel while coming across. His first connection with the drug business was in the store of Elias Durand, at the corner of 6th and Chestnut streets, in whose employment he rose step by step from the lowest to the highest position in the store. He went into business for himself in the upper part of Philadelphia, and afterward was associated with the late Prof. Edward Parrish as manager of the pharmacy so well known in Philadelphia. Upon Mr. Parrish's retiring from business, Mr. Bakes opened a pharmacy at 1100 Arch street, from which he removed after a few years to the corner of Tenth street, but one block east. He continued there for some years; at the same time was interested in a drug store at Ocean Grove, N. J. His business there was a flourishing one until his health failed him about two years ago. Although conscious of severe suffering, he never seemed to feel his sickness dangerous till a short time before his death, when any exertion seemed to prostrate him entirely. Mr. Bakes was one of the most active and intelligent members of the Philadelphia College of Pharmacy; for a long period he was a member of the Board of Trustees, and for 16 years efficiently performed the duties of Secretary of this body. He was a graduate of the class of 1855 Philadelphia College of Pharmacy. Deceased leaves a widow and two sons. Mr. Bakes became a member of the Association in 1864, at the meeting held in Cincinnati, Ohio.

Lyman R. Blackman died at his temporary residence on Bath road, Newport, R. I., in the 49th year of his age. Though a native of Michigan, Mr. Blackman had long been a resident of Newport, and was identified with all her best interests, both socially and in a business way. His first position in Newport was as manager of the Newport drug store of Caswell, Hazard & Co., a position which he held until the withdrawal of Mr. Caswell, when he joined in the formation of the firm of Caswell, Massey & Co., and assumed the responsible and laborious position of sole manager of its Newport branches. He was a gentleman highly respected and esteemed by all classes of society, and his death, though long expected, is a loss felt by the entire community of Newport. Mr. Blackman held a number of positions of trust and honor. He was a life member, new style, of our Association, becoming a member in 1865, at the meeting held in the city of Boston.

William P. Campbell, of Cumberland, Md., was drowned near "Dougherty's Wide Water," two miles below his place of residence, on Saturday, October 11, 1884, while out on a fishing excursion, by the upsetting of the boat. Deceased was but 27 years old, and was a native of Charlestown, West Virginia. His parents died only a few years previous. His father, James Campbell, had been sheriff in 1859. Mr. Campbell spent the greater portion of his life in Cumberland, and always bore the highest character. He learned the drug business in the store of his uncles, J. B. H. and E. H. Campbell, and, after both had died, took charge of the business, entering the firm of W. P. Campbell & Co. Though young in years he had shown good business ability, and conducted the old establishment up to its old-time standard. In every walk of life he was honored; gentle in manner, unassuming, earnest in purpose, and upright in principle, he had made an honored name for himself. In 1882, Mr. Campbell was married to a Miss Duke, who survives him with one child. Deceased became a member of our Association at the meeting held in Indianapolis, in 1879.

Peter L. Dohmen, of Milwaukee, Wis., died April 1, 1887, of cancer of the œsophagus, after a lingering illness of seven months, at his residence, No. 218 Greenbush street. Mr. Dohmen was born in the city of Dueren, Rhenish Prussia, October 9, 1838, and was therefore, at the time of his death, in his 49th year. In his native town he was educated in the ordinary schools, after which he began the study of pharmacy by entering the shop of apothecary Hoengen. He came to America in 1859, immediately entering the employ of Dohmen & Mueller, corner Reed and Lake streets, Milwaukee, whose successor he became in the year 1861, and which business he conducted, and at the same place, until his death. Mr. Dohmen was a safe and conservative business man, at the same time very public spirited, taking an active part in all affairs of a benevolent character, being an active member of the Wisconsin Phonological Association for the Education of Deaf Mutes, the German Association for the Aid of Emigrants, and associated charities. He was a member of a number of secret benevolent associations and musical societies, of the Wisconsin Pharmaceutical Association since 1881, and of the Milwaukee Pharmaceutical Association from its organization. He was married, and leaves a wife and eight children. His connection with our Association was made in 1884, at the meeting in Milwaukee.

William J. Earnshaw, of Cambridge City, Ind., who died in Indianapolis June 26, 1887, of lymphadenoma, was born September 7, 1862, in Cambridge City, Ind., was educated in the city schools of Indianapolis, began the study of pharmacy with Leachman & Co., Indianapolis, in 1880, and attended the Philadelphia College of Pharmacy session 1880–1. Mr. Earnshaw was a studious young man, and much in love with his adopted profession, but he was not blessed with good health. He was upright and conscientious in all his dealings with his fellow men, was a dutiful son in all that the expression can mean, patient in his prolonged sufferings, and died, as he had lived, an honored and respected citizen. He became a member of our Association at the meeting held in Kansas City, Mo., in 1881.

Stanislas Martin died in Paris last June, aged 81 years. He was born at Issoudun, August 8, 1806, became an apprentice in pharmacy in 1822, and went to Paris in 1837, where he subsequently established himself and was engaged in business until some years ago. For a number of years he was president of the Paris Société de Pharmacie, and in former years contributed many practical papers to various journals, several of which were translated and published in English and American journals. The deceased was elected an honorary member of the American Pharmaceutical Association in the year 1872.

Oscar Monsarrat, of Baltimore, Md., died there March 6, 1887, near the place where he was born in 1813. Sixty years of his seventy-four, with but slight intermission, were actively employed in the ranks of pharmacy. His father was a sea captain of good reputation, who died when Oscar was a small boy. The death of his father imposed upon his youth the cares and responsibilities of the family, and nobly did he come to the assistance of his mother. At the age of 14, he entered the pharmacy of Nicholas Monsarrat, located on Baltimore St., opposite the Carrolton Hotel, where the Baltimore Publishing Company now is. His cousin Nicholas was one of the most reputable apothecaries of his day, being competent as an instructor and severe as a disciplinarian. In those days many of the chemicals and preparations now supplied by manufacturing pharmacists were made on the premises, therefore Mr. Oscar Monsarrat had a good practical drill in the art of manufacturing and dispensing. On leaving the establishment of his cousin he opened a pharmacy on South Broadway; business not proving as successful as he had reason to expect, he closed out his establishment and went to Cincinnati, but not being pleased with his new home he returned to his native city and re-entered business near his old place. About forty years ago he purchased the house where he died, 316 South Broadway, and to the time of his last illness devoted himself most industriously to the discharge of his responsible duties, and for many years enjoyed a liberal patronage in the prescription business. Deceased was conservative, and so opposed to display that he was quite content to practice pharmacy in its legitimate channel. He was an active member of the Maryland College of Pharmacy, and took a great deal of interest in everything to make it prosperous. He was one of the most benevolent men in the city of Baltimore, was always willing to help the deserving poor, and particularly those who needed medical relief, as he never turned away any of this class without assistance. He was a good son, a good husband, a good father, and a true friend. Deceased united himself with our Association at the fifth annual meeting in 1856.

Dillwyn Parrish, the descendant of a line of charitable ancestors, passed quietly and peacefully into the beyond, at his residence, No. 1017 Cherry street, Philadelphia, Pa., September 17, 1886. He was born in the city of "brotherly love," in 1809, and was the son of Dr. Joseph P. Parrish, one of the best known and accomplished physicians and surgeons of his time, as well as one of the leading members of the Society of Friends. He thus grew into manhood amid surroundings well fitted to produce the man the deeds of his after life have shown him to be. The sound classical education, considered in his youthful day as an essential mental training for those intending to engage in a professional pursuit, was obtained in his native city at the "Friends" school. Quite early in life he was apprenticed to learn the drug business, and with laudable enterprise, attended the lectures of the Philadelphia College of Pharmacy, from which he graduated with the class of 1830. He became an active member of the Alumni Association by resolution, at the first annual meeting of the Association. A short time after his graduation, he embarked in business at Eighth and Arch streets, Philadelphia, where he remained a successful and honored pharmacist for twenty years, retiring from all active business pursuits in 1860. On March 29, 1869, he was elected President of the Philadelphia College of Pharmacy, and he remained the head of that institution until the constantly increasing infirmities of a ripe old age made his resignation a necessity on March 30, 1885, when he retired, to the great regret of his colleagues, who realized in full measure the value of the calm, quiet dignity, and strength of character displayed in the execution of his official duties. He was a director and member of the Board of Corporators of the Women's Medical College, one of the founders of the Orthopedic Hospital, a trustee of the Grandom Fund for supplying coal to the deserving poor, as well as a member of several minor charitable organizations. A family of two sons—Joseph Parrish, a member of the Philadelphia bar, and Stephen Parrish, an artist—survives him, his esteemed wife having died a few years previous. Mr. Parrish was a life member (old style) of our organization, having joined the Association in 1870, at the meeting held in the city of Baltimore, Md.

R. S. Priddy, of Windsor, Ontario, Canada, died there, after laboring in the pharmaceutical field for a long period of years. He became a member of the Canadian Pharmaceutical Society in May 1868, and was enrolled as a member of the Ontario College of

Pharmacy in June 1871. When the above Society obtained its act of incorporation, in 1868, he was a resident of London, Can., but he removed to Windsor in 1870. In 1884, he sold his drug store on account of poor health, and went to Florida, thinking the change of climate would be of some benefit to him. He recuperated somewhat, but it was only for a short time, when he grew worse and died. Mr. Priddy was considered a very skillful and scientific pharmacist, and a very conscientious man in all his dealings. He became a member of our Association in 1882, at the meeting held at Niagara Falls, N. Y.

Paul Reinlein, of Washington, D. C., died there in March last. He was born in Germany, in 1830, and passed a number of years in Cincinnati, whence he removed to Washington, D. C., in 1875. For several years he had successfully conducted the drug business in two different stores. His wife died about two years ago. Mr. Reinlein was at one time president of the Pharmaceutical Association of the District of Columbia. He was a life member (old style) of our Association, having joined at the meeting held in 1856.

Thomas Restieaux, the well-known Tremont street druggist of Boston, died at his late residence, in August last. In the death of Mr. Restieaux, Boston loses one of its oldest business men, and many charitable societies a warm supporter. The deceased was an active member of a large number of societies, charitable and otherwise. He was 75 years old, and for 52 years had been engaged in the drug business in Boston, formerly on Hanover street, corner of Cross street, but for a long term of years at 29 Tremont street. He was born at the North End, of French parents. He early learned the drug business, serving his apprenticeship with the celebrated Dr. French. For years he was the leading druggist of the North End. In 1836 he married Eliza Ann Green. He leaves two daughters and one son. He acted as president of the Massachusetts Charitable Fire Society for 19 years, and at the time of his death he was a trustee of the Lying-in Hospital, on McLean street, and Treasurer of the Green Dragon estate, of Paul Revere fame. Deceased was one of the oldest members of our Association, having connected himself with it in the year 1853, at Boston.

Herman F. Reum was born on the 13th day of January, 1837, in the city of Hamburg, the great seaport town of Germany. His parents removed soon after to the beautiful city of Cassel, where he enjoyed the advantages of good schools. He became the pupil of the well-known chemist, Schwartzkopf, of the same place. From there he emigrated to America, in 1856, and soon after his arrival here he pursued his studies under the late Prof. Adolph Fennel. After qualifying himself for the position of pharmacist, he became a clerk in the pharmacy of Mr. Wm. Karrman, remaining there several years. He then purchased the drug store on corner Clark and John streets, and some years afterwards the pharmacy corner of Fifth and Broadway, where he remained actively engaged until the time of his death, which occurred on the 31st day of May, 1887. Always taking an interest in matters of pharmacy, he was honored with the presidency of the Cincinnati College of Pharmacy for a term. He became a member of our Association in 1864.

Elijah Smalley, of Boston, died of inflammation of the bowels, May 23, 1887, at his home, 35 Emerald street, Boston, at the age of 70 years. He was born in Brookfield, Vermont, and served an apprenticeship at the drug business with Dr. Samuel Alden in Hanover, N. H., for seven years, after which he clerked for Thomas Restieaux, of Boston, two years; then he commenced business on his own account on Pleasant street, where he remained twelve years, removing to Hanover, N. H., where he kept a drug store six years, after which he returned to Boston, and for some years engaged in other business, and in 1860 he purchased a drug store on Harrison avenue, where he remained twenty-five years, retiring from business in 1885. He was a good man, and very much thought of in the community where he lived. He became a member of our Association in 1860 at the meeting held in New York City.

Samuel F. Troth, of Philadelphia, Pa., died there November 18, 1886, in the eighty-sixth year of his age. When the Philadelphia College of Pharmacy was organized in 1821 he was not of the requisite age to join it in membership; but he attended the first course of lectures delivered in that institution during the winter 1821–22, and then passed the examination, which rendered him eligible for membership in the College, the degree of graduate in pharmacy not being conferred at that time, nor for several years afterwards, until 1826. Mr. Troth was a member of the College for over sixty-four years, and served the institution faithfully as Chairman of the Committee on Sinking Fund, and as Vice-President. During the past eighteen years he had retired from active work in the College; but his interest in its affairs and its progress remained unabated to the last. Deceased was a life member (old style) of our Association; he became a member in 1857, at the meeting held in the city of Philadelphia.

Chas. G. Underwood, of Boston, died very suddenly of heart disease, at his rooms in the Maverick House, East Boston, on the morning of November 19, 1886. Deceased had conducted a successful retail business for a period of about thirty-five years in one location, and was highly esteemed in the community of which he had been so long a resident, both for his great moral worth and the sterling integrity that characterized his business life. He was married, and left a widow but no children. At the meeting held in Boston, in 1865, he became a member of our Association.

R. W. Vandervoort, of Newark, N. J., died very suddenly, in September 1886. As a lad he had to make his own way in the world, and when still quite young, secured a position in his native city, Newark, N. J., taking a place in the office of Dr. Akers, a practicing physician, but still continuing his studies at school as opportunity permitted. A position in a drug store was finally secured, and his way up as a partner and then proprietor came with later years. Faithfulness and perseverance were the prominent traits of his character, and these secured for him the success that followed. His store was one of the most popular in that section of Newark. He was one of the founders of the Newark Pharmaceutical Association, and from this came later the New Jersey State Pharmaceutical Association. His services for pharmacy were hearty and generous. As a member of the State Association he was active, and rendered valuable aid. On the Board of Pharmacy he served for three terms, and was conspicuous for wise counsel, clear judgment, rare discretion and correctness. As a member of our Association, elected in 1870, at Baltimore, he frequently attended the meetings.

George Christoph Wittstein died at his residence in Munich, June 2, in the seventy-eighth year of his life. Born in Munden, Hanover, January 25, 1810, he received his education at the classical school (gymnasium) of his native city, with which his father was connected as teacher of mathematics. At the age of 14 he entered upon his apprenticeship lasting five years, was then assistant in Clausthal, Gustrow, and Hannover, passed in the latter city in 1834 the state's examination, and in the fall of 1835 went to the University of Munich to further pursue his studies. While a student here he was awarded (August 12, 1836) the prize (33 florins) offered by the society of pharmaceutical students in Munich, for an essay on the influence of ammonia and ammonium salts upon the solubility of, in water insoluble, oxides and salts. The judges in their report stated, among other things, that, although temperature, concentration, and quantitative proportions had not been sufficiently considered, yet the researches had evidently been made by a thinking, well-informed young chemist, from whose diligence science might expect much enrichment in the future. This prediction has been well fulfilled by a long, industrious and useful life. After obtaining the degree of doctor of philosophy, he remained with Professor J. A. Buchner for fourteen years as his assistant and superintendent of the chemical laboratory. In 1851 he accepted a call as professor of chemistry, technology, and natural history to the district school and agricultural institute at Anspach, but after two years returned to Munich, where he resided and labored for many years as private teacher and analyst. His first literary work was an essay on impurities in commercial zinc and zinc sulphate published in 1836 in Buchner's Repertorium IV. During the following nearly forty years these labors were continued, since the beginning of 1852 in the "Vierteljahres-schrift für Practische Pharmacie," which periodical he conducted for twenty-two years. Aside from his journalistic labors Prof. Wittstein was also engaged in other literary works, two of which have been translated into the English language, one on practical pharmaceutical chemistry in 1853, by L. Darby, and the other on the organic constituents of plants, more recently by Baron Von Muller. In the German language there were also published from his pen an etymological botanical dictionary; qualitative chemical analysis, 1851; outlines of chemistry, 1852; refutation of the theory of chemical types, 1856; secret nostrums (4 edit., 1876); articles of food and drink, 1878; compendium of chemicals, 1879; translation of Plinius' natural history, 1880–82; pharmacognosy of the vegetable kingdom, 1882; and general indices to several serial publications. Methodical, careful, and painstaking as an investigator; clear, accurate and reliable as an author; just and sincere, though occasionally too severe and harsh as a critic—thus may be summed up, in the opinion of some, the causes for the intrinsic value of Wittstein's scientific labors, carried on unceasingly through half a century—an example of industry and usefulness well worthy of emulation by the young pharmacists of the present generation. The deceased was an honorary member of the Philadelphia College of Pharmacy, and of other pharmaceutical societies in this country. In 1868 he was elected an honorary member of our Association.

J. Willets Worthington was born October 5, 1846. He died of Bright's disease January 9, 1887. He studied the drug business with Mason McCollin in Philadelphia. In 1872 began business for himself in Moorestown, New Jersey, and remained there for a number of years. He then purchased the store at the corner of Eleventh and Arch streets, Philadelphia, in 1883, and owing to impaired health sold it again in 1885. In the winter of 1886–87 he visited Leavenworth, Kansas, in search of health, and returned apparently much improved, but shortly after grew worse and was confined to his bed for five weeks until he died. In 1871 he was married to Miss Susanna R. Lippincott, of Westfield, New Jersey, and had four children, two now living. He attended lectures at the Philadelphia College of Pharmacy, and graduated in 1871. Mr. Worthington was a very conscientious pharmacist, a fair-dealing man, a kind and affectionate husband, and a good and loving father. He became a member of our Association in 1873 at Richmond, Va.

In concluding this, my annual report, permit me to return my sincere and heartfelt thanks to the members of the Association, who rendered me valuable assistance when needed.

GEO. W. KENNEDY.
Chairman Committee on Membership.

Messrs. Zwick, Colcord and Remington referred to the surplus in the treasury, and the Treasurer stated that from $4000 to $5000 could safely be transferred to the Permanent Fund. On motion of Mr. Thompson, seconded by Mr. Colcord and others, it was unanimously resolved that $4000 be invested in bonds under the supervision of the Council.

Mr. Remington, Chairman of the Committee on Management, read the report of that Committee, and printed copies of the report were handed to the members present.

TO THE MEMBERS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

Gentlemen: Your Committee to whom was intrusted the duty of bringing forward a plan for the better management of the meetings of this Association, respectfully submit the following for your consideration:

In view of the fact that many changes have occurred in late years to alter the status of the Association, and that altered conditions now exist, which are largely due to the formation of State Associations and the influence of pharmaceutical legislation in the various States, it would seem to be not only wise and expedient for this body to adapt its Constitution and By-Laws to the new order of things pharmaceutical, but absolutely necessary if it is to maintain its supremacy and its reputation for representing all of the pharmaceutical interests of the country. It must have been evident to even the casual attender of our annual meetings that much useful time has been lost in the past through the lack of systematic apportionment of the time at the disposal of the Association; then again, if it is known beforehand by the members generally that certain subjects will be discussed at specified times, it will enable them to make their arrangements to be present and take an active part, and this will tend to make the discussions much more interesting and valuable. Heretofore the very important subjects of commercial interests, pharmaceutical education and the labors of Boards of Pharmacy, have received no direct recognition from this Association. Your Committee feel that in the past this body has suffered loss in this respect, for we believe that a National Association should be so comprehensive in its scope that every important interest should be effectively represented.

Many alterations in the By-Laws will be necessary in order to give effect to these views. These may be briefly summarized as follows:

1. Owing to the improved condition of the finances the initiation fee can be safely dropped.

2. A better plan of gaining new members is proposed.

3. The business of the Association has been systematized and arranged *so as to do better work and more of it.*

4. A field has been opened whereby a closer relation and bond of fellowship with the State Associations can be established.

5. A readjustment of the relations between the Council and the members at large, which will remove any difficulty which may have arisen in the past.

In order to increase the membership and recruit our ranks from the best classes of pharmacists, the following changes are proposed: Strike out Articles II. and III., Chapter VIII., and substitute for them the following:

Article II. Any two members of the Association may propose to the Council the name of any person eligible to membership, and if approved, the Council shall recommend the person named to the Association, and if the Association shall by vote invite said person to become a member, his membership shall be completed by his signing the Constitution and By-Laws and paying the annual contribution for the current year.

Change Articles IV., V., VI., VII., VIII., IX., X., XI., to Articles III., IV., V., VI., VII., VIII., IX., X.

In present Article VI., Chapter VIII., fourth line, strike out the words "and the usual initiation fee."

In Article VIII., Section 2, Chapter VI., first line, strike out the word "one" and insert "each." Second line, strike out the words "approved by the Committee on Membership" and insert the word "proposed." In the fourth line strike out the words "elect them" and insert "recommend them to the Association."

In Section 3, same Article, third line, strike out the words "balloted for," and insert "voted on by the Association."

The following additions and changes to the By-Laws are suggested in order to introduce the new feature of work through sections.

Change the heading of Chapter IX. to "of Meetings and Sections."

Chapter IX.. Article I. First line after the word "meetings" insert "of the Association."

For Article II., substitute the following:

Article II. To expedite and render more efficient the work of the Association, four sections shall be formed as follows: 1. Scientific Papers. 2. Commercial Interests. 3. Pharmaceutical Education. 4. Legislation.

For Article III. substitute the following:

Article III. The business of the Association shall be arranged so that the labors of each section shall be considered only at the session or sessions to which they are especially assigned.

For Article IV. substitute the following:

Article IV. The first, second and last sessions of the annual meeting shall be devoted to the general business of the Association, and sufficient time shall be assigned to the Association at the beginning of all other sessions to read its minutes and act on the report of Council on membership.

Add the following new Articles:

Article V. At the third and fourth sessions the business of the Section on Commercial Interests shall be considered.

Article VI. The fifth, sixth, and seventh sessions shall be devoted to the reading of scientific papers and the discussions thereof.

Article VII. The sections on Legislation and Pharmaceutical Education shall hold their meetings at the eighth session, either at the same time or one after the other as may be determined by the Association.

Article VIII. A chairman and secretary shall be elected by ballot by each section to serve at the special meetings of said section. And the minutes of each meeting, together with all documents and papers which belong to each section, must be placed as soon as possible in the hands of the Permanent Secretary for publication or safe keeping.

Article IX. The Chairman of each section shall preside at each of its meetings, shall prepare a short address treating upon the subjects connected with his section, to be read before the section at the next annual meeting.

Article X. There shall be elected by each section a committee, of which the Chairman of the section shall be Chairman, to whom shall be delegated the duty of arranging in advance the business to come before the section at the next annual meeting; these committees in each case becoming standing committees of the Association.

For Article XI., insert present Article II., Chapter IX., as it stands, except that in Section 7, line 3, strike out the words "the Standing Committees."

For Article XII., insert present Article III., Chapter IX., as it stands, except that in Section 3, line 2, strike out the words "and committees." Also strike out Section 4, and change the numbers of Sections 5, 6, 7, to numbers 4, 5, and 6.

Article XIII. The order of business for the meetings of the sections shall be determined by each section for itself.

Article XIV. No money shall be appropriated from the treasury by any of the sections.

Article XV. At the last session of the Association the newly elected officers of the Association shall take their respective places.

Chapter I., Article I., line 1. After the word "Association," insert the words "except those of the special sections," as hereinafter provided.

Chapter VII., Article I., line 1. Strike out the words "elected annually five" and insert the word "six." In line 2 strike out the words "the drug market," and insert "commercial interests." In line 4, strike out the word "and" and insert after the word "legislation," "and a Committee on Pharmaceutical Education." Line 3, strike out the words "and queries" and insert before the word "papers," the word "scientific."

Strike out Article II., Chapter VII., and substitute the following:

Article II. The Committee on Commercial Interests shall be appointed by the Section on Commercial Interests.

They shall be charged with the work of arranging in advance the business to come before the section at the next annual meeting. They shall propose each year a subject for discussion at the meetings of the State Associations, and at the following annual meeting of this Association, they shall present a report of the action of the State Associations upon the subject proposed.

Article III., Chapter VII., line 1. Strike out the words "and queries," and insert after the words "committee on," "scientific."

Insert after the word "Papers," "shall be appointed by the Section on Scientific Papers. They shall arrange the business of the Section and."

Article IV., Chapter 7, line 3, strike out the words "and queries," and insert after the word "on" the word "scientific."

Article V., Chapter 7, line 3, strike out the words "and queries," and insert after the word "on" the word "scientific."

Article VI., Chapter 7, line 1, insert after the word "Essays," "which shall be appointed by the Chairman of the Section on Scientific Papers."

Article VII., Chapter 7, line 1, insert after the word "legislation," "which shall be elected by the Section on Legislation," and after the word "year," fourth line, insert "they shall arrange the business of the section in advance of its meetings, and propose suitable subjects for discussion."

Article VIII., Chapter 7, line 1, strike out the words "it shall be the duty of," and in line 2, after the word "Pharmacopœia," insert "shall be appointed by the President of the Association. It shall be their duty."

Add the following new Article to Chapter 7:

Article IX. The Committee on Pharmaceutical Education shall be appointed by the Section on Pharmaceutical Education, and it shall be their duty to arrange the business of the section in advance of its meetings, to propose suitable subjects for discussion, and to attend to such duties of the section as may be delegated to them.

Your Committee recommend the following change in a By-Law relating to Council meetings:

Add to Article I., Chapter VI., the words:

Any member of the Association may attend the meetings of the Council, and may, by a special vote of the Council, be invited to speak on any subject under discussion.

Add to Chapter VI., Article II:

No elected member of the Council, after having served one term, shall be eligible for re-election to the Council to serve the next succeeding term.

The following superfluities in the By-Laws are recommended to be dropped:

Article II., Chapter I., and Article IV., Chapter II. (See Chapter VI., Article III.) This necessitates an alteration in the numbering. Chapter I., Articles III., IV., V., VI., VII., VIII., IX., X., to be changed to Articles III., IV., V., VI., VII., VIII., and IX.

The Committee respectfully recommend an addition to Chapter III., as follows: *Article III.*, An exhibition of objects interesting to pharmacists shall be held each year, under the direction of the local secretary and the Committee on Commercial Interests.

They also recommend the incorporation of the American Pharmaceutical Association.

Joseph P. Remington, M. W. Alexander, S. A. D. Sheppard.
W. S. Thompson, T. J. Macmahan,

Vice-President Alexander occupied the chair.

On motion of Mr. Colcord, the report of the Committee on Management was accepted, and laid over for action.

In answer to a question by Mr. Brown, it was stated that under the plan proposed, every member of the Association, by virtue of his membership, was also a member of every section.

MR. HALLBERG,—Is there any real substantial advantage in having the two sections on Legislation and on Pharmaceutical Education? It seems to me that having four sections would necessarily make the attendance on each very slim. I think that the nearer we bring legislation and education together the better it will be; and we would then have the most desirable kind of debate on the subject of legislation. If the chairman could throw some light on that point, I would like him to do so.

MR. REMINGTON.—Several members to whom this plan has been submitted have had the same thought as Mr. Hallberg. There are many points on pharmaceutical education which are equally important with those on pharmaceutical legislation, and it was for that reason that these two sections were put together, and that provision was made in the By laws which allowed the Association to hold the two sections, either separately or one with the other, or, if you choose, merge them into one. But it was believed that more work and better work would be gotten by having the two. There is an organization of the Boards of Pharmacy, and conferences have been held by representatives of the colleges. There are usually enough college professors at the annual meetings to make up a very effective and valuable section, and they would like to exchange views on the subject of education, whilst they might not be much interested in Boards of Pharmacy. Therefore, it was thought best to try the plan proposed, and see how it will work. These two sections will give the Association no trouble. I have no hesitation in saying that it is largely a matter of experiment, because we want to try several new things, but we don't want to try it on sections of greater general importance, involving larger interests, so as not to endanger the success of the whole plan.

MR. HALLBERG.—After the explanation that has been given, I think that the action is correct. This is an experiment, and we can see how it will work.

The reading of the proposed changes in the By-Laws was accompanied by verbal explanations of the more important clauses.

MR. REMINGTON.—It is proposed to drop from the present Art. III., Chapt. VIII, the payment of the initiation fee and the method of obtaining new members has been changed. Heretofore applications were signed by the party who desired to join. Now it is proposed not to ask the person to apply for membership in the Association, but for two members of the Association to invite that gentleman to come in with us and become a member of the A. P. A.

The change in the present Sec. 2, Art. VIII., Chap. VI., to strike out the word "one" and insert "each," contemplates that propositions for membership may be received at one session of the Council and acted upon at the next session of the Association. It is proposed to have a short session of the Association at the beginning of every session of a section, in order that the minutes of the Association and of the Council may be read—to have those names brought forward and the Association act on them. It would not be very complimentary to a new member coming here to enter this Association, to find that after his name had been proposed he would have to wait until the last day before he could be elected.

Article IV. has been drawn up to prevent the mixing of the sessions of the Association. It is hoped and expected that this will be a cast iron arrangement, and that when business is assigned for a certain time no other business will be in order.

The time may come when this Association may become so large, and its interests so thoroughly developed, that it will be necessary to have sessions of two or more sections at the same time. The American Association for the Advancement of Science, the British Association, and all large associations representing scientific interests, have had to adopt that course; but your Committee have felt that whilst it is very well to provide for the future, there were so many men in this Association interested in the reading of scientific papers, and equally interested in the reading of papers on commercial interests, that they would want to appear in both sections; hence it was thought best for the present not to introduce this feature of having sections meet at the same time, but the Association may allow the sections on Pharmaceutical Legislation and Pharmaceutical Education to hold a session either at the same time or subsequently, as the Association shall determine. It was proposed to try that plan in this way, where it will do no violence, and if the plan succeeds, it can be enlarged upon.

The new Article XIV. is not designed for the purpose of keeping the sections from using any money at all; money must be expended through the Association, and no section should have the power to vote itself any money.

The Committee on Drug Market is virtually abolished by the proposed changes in Chapt. VII. Art. 1; but if the Section of Commercial Interests desire at any time to have a report on the drug market, they have the power to appoint such a Committee. It was believed best to pursue this plan, and enlarge the scope of the old Committee on the Drug Market by making it a Committee on Commercial Interests. There are, as you all know, a large number of commercial interests which it is well to take care of.

The Committee thought that some means of bringing the various Associations into closer contact was needed, and it was believed that the plan proposed in Art. II. Chapt. VII. would be a simple way of bringing about a closer relation through the Committee, proposing a subject for discussion. This could be acted upon by all the Associations, and we could gather in their reports and thus present the wisdom of all these bodies throughout the country upon the subject that had been proposed.

According to our present By-Laws, the Nominating Committee nominates the officers and the Standing Committees; but it was believed that the Committees should be elected by the several sections, and that in this way we would have the services of men well fitted for the work of those sections. The Committee on the Revision of the Pharmacopœia is of very great importance, representing all the interests combined. It was thought to be better that the whole Association should appoint that Committee.

The addition to Art. I. Chapt. VI. is proposed because the Council is the body appointed to do the work of this Association. There never has been in the past any secrecy in regard to the sessions of the Council. Many members of the Association have been present at such sessions, and my connection with the Council enables me to speak understandingly upon that subject; but it was believed to be better to have the By-Law make record that any member of the Association can attend the meetings if he wants to.

In reference to Article II. Chapter VI., that is introduced in order to remove any misconception that the members of the Council were succeeding each other.

"The officers of the Association shall be ex-officio members of the Council," is one clause that applies to all, and therefore it is not necessary to have it repeated in three or four places. It has only been done to make the By-Laws conform with each other, and has no bearing on anything else.

It has been the judgment of the Committee that the Association has suffered a loss in interest from discontinuing the exhibition. Now that we will have a Section on Commercial Interests, it was believed to be best to throw the work of arranging for this exhibition into this Section, where we thought it properly belonged.

Mr. Sayre moved that the address of the acting President be referred to a committee of three. Carried.

Mr. Nicot moved that the report of the Nominating Committee be deferred until Wednesday. The motion was discussed by several members, but was not seconded, when Mr. Thompson moved that the second session be held at 8 o'clock the same evening. The motion was seconded, and was amended by Mr. Remington, that when the Association adjourns it adjourn to meet at 9 o'clock Tuesday morning. This amended resolution was adopted.

The Secretary read the credentials of the delegation from the Kalamazoo Pharmaceutical Association, and the delegation was received.

Mr. Sloan moved that the medical fraternity of Cincinnati, Covington and Newport be invited to meet with us, and that the courtesies of the floor be extended to them. Carried.

A motion by Mr. Seabury that the President send a greeting to the International Medical Congress now in session at Washington, was, after some discussion, withdrawn.

On motion of Mr. Menninger, the Association adjourned until Tuesday morning.

Second Session.—Tuesday Morning, September 6th.

The meeting was called to order at 9:30 o'clock by Vice-President Menninger. The minutes of the first session were read, when Mr. Bedford moved that the reference to the International Medical Congress be omitted. The motion was not seconded, and the Chair ruled that the minutes must be a correct record of the transactions, and no part of it omitted. The minutes were then approved.

Mr. Kennedy read the minutes of the Council, which were approved.

Eighth Session of Council, September 6th (7 members present).

The applications of twelve candidates for membership were examined and ordered to be reported to the Association.

The following applicants for membership, previously reported, were elected:

William Aird, Jacksonville, Fla.
Henry K. Appleton, Jr., Boston, Mass.
Chas. G. Baier, Detroit, Mich.
Albert E. Brown, Mobile, Ala.
Chas. H. Butler, Oswego, N. Y.
Richard D. Collins, Crittenden, Ky.
Harry C. Cook, Columbus, O.
Henry C. Cushman, Pensacola, Fla.
Alfred De Lang, Cincinnati, O.
Ernest J. Eberhart, Indianapolis, Ind.
Edward J. Finnerty, Jr., Centralia, Pa.
Israel M. Hodgkins, Scottdale, Pa.

Fred. W. Jillson, Attleboro, Mass.
John Johnson, New Orleans, La.
Samuel S. Jones, Wilkes-Barre, Pa.
Edward Kremers, Milwaukee, Wis.
William B. Krosskop, Oil City, Pa.
Abraham L. Metz, New Orleans, La.
William H. Niblo, East Orange, N. J.
Robert D. Peyton, Louisville, Ky.
Edward L. Pieck, Covington, Ky.
William A. Richardson, Boston, Mass.
Ferdinand T. Schmidt, New York, N. Y.
William Simonson, Cincinnati, O.
John M. Tobin, Montclair, N. J.
Benjamin Ward, Mobile, Ala.
Edwin A. Warren, St. Paul, Minn.
Oscar M. Wright, Independence, Mo.
Seward W. Williams, New York, N. Y.
John K. Young, Bristol, Pa.
John F. Zuenkeler, Cincinnati, O.

The Secretary read the credentials of the delegation from the Norfolk and Portsmouth Pharmaceutical Association, which were received.

Mr. Seabury read the following:

REPORT OF NOMINATING COMMITTEE.

CINCINNATI, *September* 6, 1887.

MR. PRESIDENT:

Your Nominating Committee would respectfully report that they met in one of the rooms of the Grand Hotel last evening, and organized by electing a Chairman and Secretary, and now submit as a partial report the names of the following gentlemen as their unanimous choice for the positions opposite which their names appear:

For President—John U. Lloyd, Cincinnati. O.
For First Vice-President—M. W. Alexander, St. Louis, Mo.
For Second Vice-President—A. K. Finlay, New Orleans, La.
For Third Vice-President—Karl Simmon, St. Paul, Minn.
For Treasurer—S. A. D. Sheppard, Boston, Mass.
For Permanent Secretary—J. M. Maisch, Philadelphia, Pa.
For Reporter on Progress of Pharmacy—C. L. Diehl, Louisville, Ky.

G. J. SEABURY, *Chairman.*
E. A. SAYRE, *Secretary.*

MR. LLOYD.—I notice heading that list is the name of J. U. Lloyd. I thank my friends—the members of this Association—for the honor conferred on me through their Nominating Committee; but, Mr. President and Members of the American Pharmaceutical Association, I beg of you to relieve me now from that position. I am not fitted to fill it. My work has been entirely in another direction. Relieve yourselves and relieve me at the same time, I ask of you.

Several members spoke in opposition to the wish expressed by Mr. Lloyd, and Mr. Sander asked the unanimous consent of the Association that the Secretary cast the affirmative ballot for the officers nominated. The consent was given, Messrs. Wm. S. Thompson and Enno Sander were appointed tellers, the affirmative ballot was deposited, and the officers nominated were declared duly elected. Ex-Presidents Thompson and Sander were requested to conduct the presiding officers elect and present in the hall to the platform. Messrs. Lloyd and Finlay were introduced by the Chair.

THE CHAIRMAN.—Gentlemen, it affords me great pleasure to introduce to you your President. I introduce him now to the members, not because it is necessary, for every pharmacist in this country knows him by reputation, but in order that we may congratulate the Association on their selection and election.

PRESIDENT-ELECT LLOYD.—Gentlemen of the A. P. A., I had expected that I should not be compelled to address you; therefore I have nothing prepared. I can only say to you that in the city of Cincinnati I have been simply a pharmacist for a quarter of a century, and I see in this audience the two gentlemen with whom I learned the business. I feel, as I address you, that if thanks are due to any, they are certainly due to those two gentlemen. I have followed their instructions, and have endeavored in no way to step outside my profession. I feel that you will have much to bear with, while I occupy this chair, and I beg of you to overlook my shortcomings. I thank you sincerely for this high honor, which I duly appreciate, and I trust that our meetings may be pleasant. (Applause.)

THE CHAIRMAN.—It affords me great pleasure to introduce to you A. K. Finlay, of New Orleans, your second Vice-President.

MR. FINLAY.—I have very little to say, gentlemen, but I thank you for the honor, which I hope will be purely honorary, as abler men precede me in the line of duty; but should it be my duty to occupy the chair, I shall do it to the best of my ability.

THE CHAIRMAN.—Gentlemen, I need not introduce to you Messrs. Sheppard and Maisch. You know them, and I have no doubt you will have occasion to admire them at their work on the stage. I will not inflict upon you a speech from either of them. (Applause.) Mr. Alexander and Mr. Simmon not being present, I will simply ask Mr. Diehl to rise in his seat, in order that you may see the handsome gentleman. I think he is the strongest force in the team, as you will find by looking at the Proceedings. (Applause.)

Reports of committees being in order, Mr. Day read the report of the Committee on Legislation (see page 398), which was accepted and referred.

Brief remarks were made by Messrs. Hallberg, Bedford, Whelpley and Schafer in relation to the appointment of Boards of Pharmacy in Wyoming and Nebraska.

MR. EBERT.—Mr. President, I think the subject of legislation deserves really a little attention at this time, when we have heard the report of the Committee on Legislation. While the Chairman of the Committee was reading these different laws and amendments to laws that have been enacted during the previous year, it came to my mind that we now have passed in the United States over thirty pharmacy enactments, of which I believe there are not two alike in their essential features. Most of the gentlemen of this Association will remember that in 1869 a draft of a pharmacy law was reported to this Association; and upon this general draft, all the pharmacy laws that have been enacted are more or less based. Now, after having passed so many laws, being so very different in their essential characters it would become this Association to make some suggestions, or frame a law, with the view of harmonizing the conflicting requirements of the pharmacy laws of the different states—the essential features that seem to be antagonistic in the registration by the different Boards. We should see to this; it is quite essential we should. One great difficulty under the laws is, for instance, that when a young man who has passed his examination in the State of Michigan, goes to the State of Illinois, he has to wait for his examination before he can accept a position as clerk or take charge of a store. The same is true in Michigan, in Ohio, and in other States. That is a barrier which ought not to exist. It is very different when a man emigrates from the State of New York to the State of Illinois to open a drug store. He has usually sufficient funds to make the investment, and, of course, can afford to wait until the meeting of the Board. But when a young drug clerk wishes to go from one part of the country, he should not be compelled to wait the pleasure of the Board; no law should be enacted that places a barrier against a young man, preventing him from earning an honest living. Of course, that brings up questions which, no doubt, will be taken up by your section on legislation. I have simply risen for the purpose of calling your attention to this very important matter. Every year, since 1869, we have had a comprehensive report from the Committee on Legislation; it has been read, passed over without comments, printed in the Proceedings, and that has been the last of it. We ought to each year scan these laws: we should criticise them—we are able now to do so. I have no objection, and do not doubt but what the people in the different States will make laws to suit themselves; but the main and essential features of these laws can and should be so closely allied that difficulties, as at the present time, could not arise.

Mr. Zwick.—No doubt the gentlemen here agree with the remarks made in regard to harmonizing the pharmacy laws throughout the whole of the United States; and this can properly be done. But there is a provision which ought to be considered in the same connection and that has been stated very explicitly in our Constitution, to regulate the system of apprenticeship and employment so as to prevent as far as practicable the evils flowing from deficient training in the responsible duties of preparing, dispensing and selling medicine. I think a committee that is to take up this subject should look very well to this article of our Constitution. If that article was universally incorporated into the laws then we would have for a basis a standard upon which to admit parties from all parts of the country; we would know then that they have served an apprenticeship, and we would have a guarantee that they have gone through a proper tuition to be received into our business. To do what the gentleman proposes we must begin at the beginning, regulate the apprenticeship as our Constitution means: this is part of our aim and duty, and I would call attention to it.

Mr. Seabury.—I would like to answer one point that Mr. Ebert makes on that question of recognizing certificates from one State Board to another State Board. I take the ground that if a man is competent as a pharmacist it matters very little whether he came from New York, Philadelphia, or from any other college; when he leaves his own State, where he has passed a creditable and satisfactory examination, I do not think that he should be admitted into another State without an examination by their own Board. If he is competent, I do not see what he has to fear in coming before the Board to have an examination. How do you know he is the person the certificate calls for? I do not believe it is the intention of any of these Boards of Pharmacists to regulate their standard in such a way that they can reflect against the education in the colleges.

Mr. Ebert.—Do you wish to debar a man coming from one State into another from practicing his vocation?

Mr. Seabury.—No, sir.

Mr. Ebert.—It is done under the law; any one having a diploma or certificate of examination from another Board must come before the Board in the State of Illinois, and must wait the pleasure of that Board to convene and hold an examination. They hold under the law at least four examinations in the State; they can hold just as many special examinations as they please, but it is a great expense to the Board to come together simply on the application of one or two persons, and it is a hardship to any one who goes into the State of Illinois to have to wait the pleasure of that Board until he can become examined. That is the point. I perfectly agree with what Mr. Seabury says, that a man ought to be competent to come up before the State Board in Maine or Missouri—that is all right, but it is a question whether we should have an interference with our business to such an extent as to be deprived for a time of the necessary help to conduct our business.

MR. COLCORD.—I agree with Mr. Ebert, it would be better to pass upon this question in the section to which it belongs, and think we had better proceed to the regular order of business.

MR. SCHAFER.—I agree with the gentleman's remark, that the subject should go before the section when established, but as there has been considerable discussion I crave the privilege of rising to make a few remarks. Mr. Ebert speaks of the hardships of a young man coming from a distant State and having to wait some months for his examination. Although the law does not prevent it, it will not be a hardship, because the Pharmacy Board does attend to business at other times besides the four annual examinations.

Mr. Macmahan moved that a committee be appointed to consider and report on the time and place of the next annual meeting. The motion was adopted, and the Secretary presented an invitation from the pharmacists of Colorado to hold the next annual meeting in Denver, Colorado.

The First and Third Vice-Presidents were introduced to the meeting by Mr. Thompson.

THE FIRST VICE-PRESIDENT, MR. ALEXANDER.—Mr. President and Gentlemen of the Association, I am very sorry that I was not here at the time to be installed with the other officers, therefore I will not occupy your attention except to say that I highly appreciate the honor you have conferred upon me by electing me your first Vice-President. I had the honor last year to be the Second Vice-President, and I am progressing.

MR. KARL SIMMON.—Mr. President and Gentlemen, first of all, I owe you an apology for not being here upon time. I do not want to ask any favor of your Association, but I thank you on behalf of myself and for the Northwest, and I hope that we shall have the opportunity of seeing you come out to our great Northwest. (Applause.)

Vice-President Alexander occupied the chair.

Mr. Diehl read the following report, which on motion was accepted and adopted.

TO THE OFFICERS AND MEMBERS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION:

Gentlemen: Your Committee on Prize Essays have the honor to report that they have carefully reviewed the papers read at the Thirty-fourth Annual Meeting, and they recommend that the Ebert Prize be awarded to Mr. Emlen Painter, for his essay on "Spirit of Nitrous Ether."

Respectfully submitted,
C. LEWIS DIEHL, *Chairman*,
EMIL SCHEFFER,
ROSA UPSON.

When the report of the Committee on the Drug Market was called for, the Secretary stated that Mr. Mason, the chairman of the Committee, was prevented from attending the meeting, but had mailed his report, which was expected to arrive to day. On motion of Mr. Remington, the reading of this report was deferred.

Reports of Special Committees were next taken up, when Mr. Simmon read the following, which was accepted and referred:

MR. PRESIDENT AND GENTLEMEN:

The Committee appointed at the last meeting to visit the National Wholesale Druggists' Association at their convention, which was held at Minneapolis in September of last year, beg leave to report as having attended to that very agreeable duty. Unfortunately Mr. Boyce, of Duluth, and the writer of this were the only delegates who put in an appearance at said meeting. As there was no business specially intrusted by this organization to your committee, your delegates conveyed to the Convention the cordial greeting of this Association, which was responded to by one of their number in a very gracious manner, in which he particularly dwelt upon the very pleasing relations the two Associations hold to each other, and assured us that they would always take the same kindly interest in our welfare, and be anxious to assist this Association at all opportunities in all affairs of interest to both Associations. Your delegates were accorded the freedom of the Convention, and cordially invited to attend at all their entertainments and banquets, and of which Mr. Boyce, if present, would be able to make a more extended report, as the undersigned, from want of time, was unable to attend same, but from all accounts, certainly must have missed quite a treat.

All of which is respectfully submitted by the Committee,

KARL SIMMON, *Chairman.*

Mr. Colcord read the following:

REPORT OF COMMITTEE ON INTRODUCTION OF FOREIGN MEDICINAL PLANTS.

As soon as possible, after receiving notice of my appointment as Chairman of the Committee "On the Introduction of Foreign Medicinal Plants," I notified the Commissioner of Agriculture of such appointment, and requested suggestions of the different members. From two of the members I received no reply, and of those received all that seemed to contain aught of interest were forwarded to the Department, where in every case, no value was placed upon them. The letters from Washington all bore the signature of Mr. Wm. Saunders, Superintendent of Gardens. From him I received a list that he was about to order from Europe, and notifying me that if our Committee wished to add to the same we must do so at once. Complying with the request, I asked that certain seeds and plants in addition, and also a copy of the Commissioner's report, be sent me. So far, after a lapse of nearly nine months, not a word in reply have I received from him. The list in the main seemed to me to be worse than useless, and so thinking, I took it to Cambridge, and showed it to Dr. Asa Gray, and asked his opinion and coöperation. Carefully scanning it, he expressed himself in vigorous and unmistakable terms in reference to it. At his request, I turned over all the correspondence and the list to him, in order that he might intelligently present the matter to the Commissioner at his next visit to Washington. The two following letters will show the results:

BOTANIC GARDEN, CAMBRIDGE, *Jan.* 13, 1887.

DEAR MR. COLCORD: The Commissioner of Agriculture was away from Washington for all this week. I have learned something of the history of that remarkable list. I now propose to address him by letter on the subject, that I may let him know how *bad* the list is. I shall have a copy taken and kept for you.

Very truly yours, ASA GRAY.

Desiring to present to your notice the list in question, I wrote the Doctor in July, requesting the copy referred to, to which I received the following:

LONDON, ENG., *Aug.* 3, 1887.

Dear Sir: I fear the letters you wish returned are not within present reach. I thought I had apprised you that the Commissioner of Agriculture being away when I went to Washington, I kindly pointed out to him the disreputable character of the list of seeds of medicinal plants which his Department had ordered—I am not sure if in time to have it countermanded. Some correspondence ensued of a formal character, but got no thanks for the trouble I had taken. I imagine that there is nothing to be done in the way your Committee proposed. Truly yours, ASA GRAY.

I quote from memory a few of the articles on the list: rhubarb, anise, aconite, belladonna, henbane, lobelia, mullein, caraway, hellebore, larkspur, burdock, catnep, boneset, arnica, dandelion, yellow dock, elecampane, bittersweet, etc.

I am fully as well persuaded as ever that the idea is feasible, and if properly and capably conducted would prove highly beneficial not only to us pharmacists, but also the public generally. In July I sent requests to each member of the Committee asking suggestions to be incorporated in my report, but only two responded. I believe that if anything is to be accomplished in this direction it must be by the appointment of a bureau in the Department devoted to medicinal plants especially in its various branches. If under the auspices of such a bureau experimental stations were established in the various states, and such seeds and plants as gave promise of being successfully cultivated were furnished the good results must soon be apparent. If possible, a small grant might be made to such stations towards expenses as would furnish annual reports to the Department. There would be no lack of efficient workers among our pharmacists and physicians. With this in view I wrote a short time since to the Commissioner, inviting him to be present at our meeting, and asking if such a bureau would require a special appropriation. I append the following reply:

U. S. DEPARTMENT OF AGRICULTURE,
WASHINGTON, D. C., *August* 17, 1887.

J. W. COLCORD, ESQ., LYNN, MASS.—*Sir:* Referring to the letter of the Acting Commissioner of the 13th inst., I have now to say that my engagements are such that it will be impossible for me to attend your meeting on the 5th proximo. As I cannot, I would like to have the horticulturist of the Department present, but find on inquiry that he will not be able to be there. I regret my inability to be with you, for the Department is in full accord with your Society, and I will gladly do anything in my power to promote its interests.

In regard to forming a Bureau especially devoted to medicinal plants, it is hardly advisable, at present, to form a distinct Bureau for that purpose, but it might well be made an adjunct to the Botanical Division of this Department, now in charge of Dr. Vasey, who is as conversant with these as with other plants, and he has already taken action in regard to them in his recent reports. To do even this, an adequate appropriation must first be made by Congress. Such an appropriation might be obtained, very possibly, if the member of Congress from your district would urge the matter before the proper Committee.

Thanking you for the courtesy of your invitation, I bespeak for your coming meeting all the success it so richly merits, and am,

Very respectfully, NORMAN J. COLMAN,
Commissioner.

Your Committee recommend that the establishment of such a Bureau by the Commissioner of Agriculture be asked by this Association, and that a petition be sent to Congress for a sufficient appropriation for its proper maintenance. Signed for the Committee,

J. W. Colcord,
R. J. Brown,
E. Scheffer.

Mr. Ebert.—The recommendation closing the report meets my approval. When the proposition was made to apply to the Commissioner of Agriculture, I knew how the gentlemen would be treated, and that they would get no attention at all. If this Association wishes to have anything done in the matter, we should go directly to Congress, and we may get it perhaps a hundred years from now. The Commissioner of Agriculture will do little or nothing for you; he is looking after the farmers.

The report was accepted and referred.

The report on the National Formulary was presented, but on motion of Mr. Diehl, the reading of it was deferred.

Mr. Hallberg spoke on behalf of the special committee appointed by the former President to present to the American Medical Association, at its meeting in Chicago in May last, the resolution passed by this Association last year (see Proceedings 1886, p. 170), requesting physicians to give preference in prescribing to preparations of well-known formulas.

Mr. Hallberg.—The Committee did not think the results warranted us in making a written report. We appeared before the American Medical Association, and the chairman, Mr. Ebert, presented the resolution passed at the Providence meeting, and also very briefly detailed to them the project of a National Formulary. After we got through we got out, and there was nothing more said on the subject.

Pertaining to the Minutes of Council read at the first session, the following reports were now read and referred for publication:

By Mr. Sheppard: Report of the Treasurer for the year 1886–87. (See page 456.)

By Mr. Kennedy: Report of the Committee on Membership. (See page 465.)

By Mr. Maisch: Report of the Committee on Publication. (See page 463.)

The Chair announced the Committee on the time and place of the next annual meeting, appointed by President Lloyd as follows: T. J. Macmahan, Geo. W. Sloan, T. Roberts Baker, Jas. M. Good and Chas. T. P. Fennel.

In compliance with a resolution passed at the first session, the Chair appointed Messrs. E. A. Sayre and H. M. Whelpley the Committee on the President's address.

Mr. Ebert called attention to the fact that at the meeting in Providence a Standing Committee had been created on the revision of the U. S. Pharmacopœia, but that such a Committee had not yet been elected.

Mr. Painter now moved that the report of the Committee on Management be taken up, and that the recommendations be considered *seriatim*. Carried.

The following amendment was adopted:

Strike out Articles II. and III., Chapter VIII., and substitute for them the following:

Article II. Any two members of the Association may propose to the Council the name of any person eligible to membership, and if approved, the Council shall recommend the person named to the Association, and if the Association shall by vote invite said person to become a member, his membership shall be completed by his signing the Constitution and By-Laws and paying the annual contribution for the current year.

Messrs. Painter and Whelpley thought that the time for completing the membership should be limited, and one year was suggested as the proper limit. On the other hand, it was suggested that this might be left with the Committee on Membership, and that if the privilege was abused, the By-Law could be amended.

The adoption of the new Article II. necessitated the changing of Articles IV., V., VI., VII., VIII., IX., X., XI., to Articles III., IV., V., VI., VII., VIII., IX., X., and the changes were ordered to be made.

Pending the consideration of the amendment to strike out in Chapter VIII., Article VI., the words, "and the usual initiation fee," Mr. Colcord moved to amend that the admission fee be retained, and that the annual dues be reduced to $4. Mr. Colcord's motion was lost, and the proposed amendment was adopted.

The amendments proposed to Chapter VI., Article VIII., Section 2, were adopted as follows: Strike out "one session," and insert "each session; strike out "approved by the Committee on Membership," and insert "proposed;" strike out at the end, "elect them," and insert "recommend them to the Association."

In section 3, same Article, the words, "balloted for," were stricken out, and the words, "voted on by the Association" inserted.

The heading of Chapter IX. was changed so as to read, "of meetings and sessions."

In same Chapter, Article I., the words, "of the Association" were inserted so as to read, "The meetings of the Association shall be held annually."

Various suggestions were made as to the title of the first Section named, but Article II. was adopted as proposed:

Article II. To expedite and render more efficient the work of the Association, four Sections shall be formed as follows: 1. Scientific Papers. 2. Commercial Interests. 3. Pharmaceutical Education. 4. Legislation.

The following Articles of Chapter IX were adopted after but little discussion:

Article III. The business of the Association shall be arranged so that the labors of each Section shall be considered only at the session or sessions to which they are especially assigned.

Article IV. The first, second and last sessions of the annual meeting shall be devoted to the general business of the Association, and sufficient time shall be assigned to the Association at the beginning of all other sessions to read its minutes and act on the report of Council on membership.

Article V. At the third and fourth sessions the business of the Section on Commercial Interests shall be considered.

Article VI. The fifth, sixth and seventh sessions shall be devoted to the reading of Scientific Papers and the discussions thereof.

Article VII. The Sections on Legislation and Pharmaceutical Education shall hold their meetings at the eighth session, either at the same time or one after the other, as may be determined by the Association.

Mr. Hallberg suggested that the work of the Sections should be subject to the approval of the Association, that important subjects might render the decision of the Association necessary.

MR. REMINGTON.—The last session is to be a general meeting of this Association for the purpose of bringing in all these subjects.

MR. EBERT.—The last session of our meeting is one usually of great hurry. It does seem that the point that Mr. Hallberg makes is a good one. There may be matters of great importance that ought to be brought before this Association prior to the last session. We know by experience that just prior to adjournment everybody wants to get away, and if there is any more business to be done he lets somebody else finish it. We ought to provide against any such emergency. This Association assembled as a body is a large representative body which should discuss important questions, but the few willing to stay to the close of the meeting ought not to be the ones to be relied upon to decide questions of vital importance for the whole country. When there are topics of that character brought forward, the sections themselves ought to have the right to call this Association together for the purpose of discussing such matters. It is all very nice to say that the last session shall cover all these important matters. I have been in meetings from the start until the last member had departed, and sometimes there were but few left to close up the business of the Association. I do not want some member to afterwards say that Mr. Ebert has regulated the affair for the Association. Now, Mr. President, if we are going to do good work, let us do it when we are assembled. Let the Sections, if they have something of great importance, at times call upon this Association; don't make a cast-iron rule that nothing shall interfere. This Association is not brought together for the simple purpose of discussing parliamentary usages; we come here to do what is absolutely necessary, and when action is had it ought not to be by a half dozen at the close of the meeting. It seems to me ridiculous when we are together, organized and ready to decide, that some one should bring up questions of parliamentary privilege. We should do away with that. We have only three or four days absolutely to discuss these matters that are of vital importance to all of us, and there should be no cast-iron rule laid down which we cannot break when we think it ought to be broken.

MR. MACMAHAN.—Mr. President, as I understand it, any member has a perfect right to come to any Section—and if he is afraid something may be done which he don't like, he can there talk to the Association as long as he may like. Now, why not confine it to the Section?

MR. SHEPPARD.—Mr. Ebert has made an objection to this plan, and says let us try the other. Gentlemen, we have been trying the other plan ever since the Association was formed, and because the other plan has proved impracticable to the minds of almost everybody, another is now brought forward, which will help us to do good work. Last year the thought was crystallized into the formation of this committee; it has been talked over in all sections of the country, and when men saw it in its entirety, there was simply a general approval. Nearly everybody said, That is the right thing to do, and when Mr. Ebert says, Let us try the other plan, don't let us forget that it has been tried ever since the Association has been formed.

MR. BROWN.—This plan of dividing off into Sections meets with my hearty favor, and I think it will serve all interests. The Sections are created for those especially interested, and if there are members who have no special interest in a Section they need not attend.

MR. EBERT.—Mr. Brown seems to be getting off the subject. What I said was this, I do not want any cast iron rule that cannot be broken. If any question comes before the Association let us decide it. I am willing to agree with everything else you have done.

MR. BROWN.—This plan of having Sections is a good one. If we are not interested in legislation, or in the commercial interests of the country, or in the scientific papers, but are interested purely in passing amendments to the constitution and by-laws, we have no business here. If I had no interests in the Section on scientific papers, I should stay out and go to the Section on legislation. If I was not interested on that subject I would go to some other Section. Each member can go to any Section he desires, and no member is compelled to stay where he has no interest.

MR. SHEPPARD.—A few words in reference to the cast-iron rule on which this plan is founded: leave out those two words, and the whole plan falls to the ground. That is the one pillar on which the whole plan rests, because a member would have to necessarily attend all the sessions in order to be prepared for some interested party who might bring up a subject and insist on having it settled at once.

MR. EBERT.—Suppose that the Committee on Commercial Interests find they have nothing very interesting before them, but there is to be a general movement for the repeal for the druggists' liquor tax. That is an illustration which I think we all understand. This Committee on Commercial Interests find that of such vital importance that every member of this Association should be made familiar with it; and that this Association as a whole, not as a Section, should act upon it; and that the President use every effort to have the Association's action carried out in a month's time. Now we come together, we prevent the Section on commercial interests from taking action; but on the last day, when but few members are present, the subject is called up and acted on. What is the effect of that? Do you want subjects of such importance decided by a few members?

MR. SHEPPARD.—In answer to Mr. Ebert's question, I would say that if the Section on commercial interests has an important item to come before the whole Association, the members of that Section are wise and discreet enough to see the necessity of holding the members to the last session, and if it is such an important matter it will commend itself to the judgment of the majority of the members of the whole Association, and they will seek to act upon it.

Mr. Schafer moved to amend Chapter IX., Article III., of the By-Laws by adding to it the sentence, "except by a vote of three-fourths of the members present." The motion was ruled out of order by the Chair, and was not entertained.

Messrs. Whelpley and Hallberg referred to several Sections possibly holding sessions at the same time, when it would be impossible for a member to be cognizant of the business before each.

Mr. Remington.—At the last session the minutes of the special Sections will all be read, the same as the minutes of the Association are finally read, so that any member coming to a last session will hear all that has been done.

Mr. Hallberg.—That is where the question arises of Mr. Ebert, whether the last session will give us ample time for the consideration of those subjects.

Mr. Remington.—The President will permit you to say what you want to say at that time. The whole plan should be so transparent that no question can be asked, and if it is asked, that every member can be satisfied. Now with regard to the cast-iron rule, the Committee has given to that point some consideration. There must be a cast-iron rule in our deliberations. The discussions, as you all know, in the past have largely interfered with the arrangement of the business, and these general sessions are for the very purpose of giving the members a chance to settle or bring up subjects of general interest. Now, with regard to the business being left to the last session, I would only say this: that if a member is so negligent of his duties to himself and to the Association that he fails to come at the proper time, when it has been printed beforehand that at such a place or session, certain subjects are to be taken up, if he cares so little about it as not to be willing to come here, I don't think that member deserves any consideration. I think all faithful members who have attended to the business of the Association will not feel that that should be set aside, but that that member should be taken care of at the last session of the Association.

Mr. DeForest.—How is it possible for the Association to consider at the last session what was done by the different Sections, if Article III., just adopted, stands with the word "only" in it.

Mr. Bedford.—There is no trouble at all.

Mr. Whelpley.—That is the point I raised.

Mr. Remington.—The business of the Association shall be arranged so that the labors of each Section shall be considered only at the session or sessions in which they are specially assigned. It is not proposed that at the last session of the Association any member may get up and object, for instance, to a resolution passed by the Section on Commercial Interests, demanding that it be reconsidered, and that the whole business of the Section be stricken out. No, he can hear what has been done; but it should be in the power of no man or no small set of men at the last session of the Association to overturn any business of the Section which has been passed upon virtually by the whole Association.

Mr. Sheppard.—The gentleman asked how we can bring in at the general business meeting the work of the Section, if I understand his question right. Each Section has a committee, and the chairman of that committee is the chairman of the Section. That committee practically has the whole work of that Section in charge. At the same time that committee is one of the standing committees of the Association, and as such can report to the Association any sectional matter.

Mr. Whelpley.—Then Section 3 is wrong.

Mr. Good.—I hope this article will pass as it reads. We can work under it to advantage. The first and second and last sessions of the annual meeting are to be devoted to the general business of the Association. At the first and second sessions we get through with most of the general work before the Association, and as Professor Remington has stated, the other sessions may be long or short, as may be elected by the members assembled. The last session may be three times as long if necessary. We can simply adjourn from one time to another, until we are entirely through.

The next article was then read :

Article VIII. A chairman and secretary shall be elected by ballot by each Section, to serve at the special meetings of said Section. And the minutes of each meeting, together with all documents and papers which belong to each Section, must be placed as soon as possible in the hands of the permanent secretary for publication or safe keeping.

MR. DEFOREST.—Will this Article require the officers of this Association to act in every Section until this goes into ballot for chairman and secretary?

MR. REMINGTON.—It is believed, and you will notice further on, that a committee is appointed by each Section to arrange the business for that Section. The appointment of a special chairman for each Section and of a secretary is necessary for several reasons. It was believed that each Section drawing especially together those particularly interested in that branch of work, would do better work and more of it if from those specialists the head or presiding officer and a secretary were chosen. This chairman, who is to present an address at the next annual meeting, would be put in sympathy with the sentiments of the Section, and in that way he could give a comprehensive and interesting summary of the work for the next year. The President of the Association presides, according to this plan, at all the sessions of the Association, namely, at the first, second and the last session; and in addition to that he is recognized at the beginning of every session, and presides for a time, to have the minutes of the preceding meeting read, and the report of the Council on membership, in order that new members may not be delayed. In reference to the chairmen and secretaries of Sections, I do not think there will be any difficulty. The Sections may decide promptly upon the method of selecting their officers. I believe it will be an interesting and valuable feature of the Sections, which will stimulate the members, will increase the work of the Sections, and will make their sessions very pleasant, as I am sure it is our wish to do.

MR. DEFOREST.—The idea is a very nice one, but it is going to consume a great deal of time. After the President of the Association has taken the time allotted by the By-Laws, the Section will have to go into nominations and then ballot for chairman and secretary. To do that, quite a considerable amount of time will be consumed. I do not believe that we are expediting the business of the Association by adopting such a method. I think it is better to let the Committee on Nominations bring in the nominations for chairman of each Section, and have each Section act on it.

MR. SHEPPARD.—When this Article was first drawn it read, "The Chairman and Secretary shall be elected immediately upon the assembling of the Section." But after careful consideration the Article was made to read as it now stands. You will notice further on that the officers of the Association take their seats at the last session. That idea will undoubtedly prove acceptable to each Section, and the election of chairman and secretary will very likely hereafter come at the last part of their sessions. The chairman and secretary will then become the officers for the next meeting, and will merely take their places at the close of the sessions of the Sections as a formality. Work of this kind will be brought up at the end of the meeting, and that will not take so much time as it would at the beginning.

MR. GOOD.—This is a very different way of electing the officers from what has been customary in this Association. For my part I would prefer to have every one of the officers nominated, and no doubt it could be done by the Nominating Committee.

It was further explained by Mr. Remington that every member of the Association could attend the sessions of each Section, and participate in the deliberations; further, that the minutes of each Section were expected to be handed to the Permanent Secretary, and read at the last session of the Association.

Article VIII was then adopted as read; likewise the following:

Article IX. The chairman of each Section shall preside at each of its meetings, and shall prepare a short address treating upon the subjects connected with his Section, to be read before the Section at the next annual meeting.

Article X. There shall be elected by each Section a committee, of which the chairman of the Section shall be chairman, to whom shall be delegated the duty of arranging in advance the business to come before the Section at the next annual meeting; these committees in each case becoming standing committees of the Association.

The newly proposed Article XI was read, consisting of the present Article II, with the exception of the words "the Standing Committees," in Section 7, the portion indicated to be omitted.

Mr. Hollister moved to amend Section 7 by striking out the words "colleges and," and by inserting between the words "each delegation" the word "state," so as to make the sentence read:

The President shall call the roll of State Associations represented, requesting each state delegation in turn to appoint one member, etc.

Mr. Ebert moved to amend the amendment by adding:

Where there are more than one State Association in one state, the delegation shall select one delegate to act for the state named.

The amendment was accepted by Mr. Hollister.

Messrs. Bedford and Day spoke in opposition to this amendment; Messrs. Parkill, Macmahan, Prescott, J. W. Miller, Lyons, and Seabury expressed themselves in favor of it. Allusions having been made to the District of Columbia and to the Canadian provinces, the Secretary stated that the Association had previously decided, that these were to be placed on the same line with a state. Mr. Remington spoke in favor of having every delegation represented on the Nominating Committee.

Mr. Good moved as an amendment to the amendment to change the word "State" in the first line to "States," and to strike out the words "Association" and "delegation" so as to make the sentence read:

The President shall call the roll of States represented, requesting each State in turn to appoint one member, etc

Messrs. Ebert and Hollister accepted Mr. Good's amendment.

Mr. Remington offered, and Mr. DeForest seconded, an amendment to the amendment, to strike out in the first line the words "States represented," and insert in the place thereof, "local organizations of Pharmacists sending delegates;" also to strike out in the second line the word "State," so as to make the section read:

> The President shall call the roll of local organizations of pharmacists sending delegates, requesting each in turn to appoint, etc.

Without disposing of this business the Association permitted the Committee on the time and place of the next annual meeting to report, and Mr. Macmahan stated that invitations had been received from Denver, New Orleans, St. Paul and Detroit, and that the Committee unanimously recommend to hold the next annual meeting in the city of Detroit, Mich., on Monday, September 3, 1888.

Mr. Ebert moved, seconded by Mr. Painter, that San Francisco be substituted for Detroit. This was decided in the negative; and a motion made by Mr. Diehl prevailed, that action on the report be deferred until the last session.

On motion of Mr. Nicot, the chairman of the Management Committee was requested to announce in the course of the afternoon the time for holding the remaining sessions.

A recess was now taken until 3 o'clock p. m.

On re-assembling, Vice-President Alexander in the chair, the Association resumed the consideration of Mr. Remington's amendment to Mr. Hollister's amendment to Section 7, Article XI. (formerly Section 7, Article II.), of Chapter IX. Messrs. Good and Prescott spoke in opposition to the motion, and on taking the question on Mr. Remington's amendment, it was lost.

Mr. Hechler now moved to amend Mr. Good's amendment, as accepted by Messrs. Hollister and Ebert, to strike out "one member" and insert "two members," so as to make the sentence read:

> The President shall call the roll of States represented, requesting each State in turn to appoint two members, &c.

The amendment was seconded by Mr. Hallberg; the question was taken, and a division being called for, 46 members were announced to vote in the affirmative, and 51 in the negative. The amendment to the amendment was declared lost.

The amendment offered by Messrs. Hollister, Ebert and Good was then voted on, and was carried; after which Article XI., as proposed by the Management Committee and amended, was adopted.

Subsequently Mr. Good moved for a reconsideration, seconded by Mr. Prescott. The question being taken by a rising vote, 53 members voted in favor of, and 33 against reconsideration.

Mr. Sheppard spoke in favor of Mr. Hechler's amendment. Mr. Canning expressed the hope that the Nominating Committee would be abolished, and that nominations would be made in Committee of the whole. Mr. Rogers held the same view, and Mr. Remington moved as an amendment that the officers of the Association be nominated in open session. The motion was seconded by many, was opposed by Messrs. Good and Ebert, and approved by Mr. Duble. The question being taken on Mr. Remington's motion with the understanding that if passed the whole of Section 6 (old Section 7), would have to be re-written, the motion was lost by a vote of 48 ayes to 51 nays. Mr. Hechler's amendment was carried by 64 ayes against 31 nays; and Article XI. was then adopted in the following form:

Article XI. The order of business at the first session of each annual meeting shall be as follows:

Section 1. Promptly at the time named in the notice issued for the meeting, the President, or in his absence, one of the Vice-Presidents, or, in their absence, a President *pro tempore*, shall officiate.

Section 2. In the absence of the Permanent Secretary, the President shall appoint a Recording Secretary *pro tempore*, who shall perform the duties of the Permanent Secretary until his arrival.

Section 3. Nineteen members shall constitute a quorum for the transaction of business.

Section 4. The President's address may then be read, after which the Council shall report the list of properly accredited delegates.

Section 5. The Council shall read the names of the candidates for membership, as provided in Section 2, Article VIII., Chapter VI.

Section 6. Reports of committees shall be presented, read by their titles, the synopsis or in full, and laid on the table for future consideration.

Section 7. The President shall call the roll of States represented, requesting each State in turn to appoint two members, the persons so selected to act as a committee to nominate officers for the Association and members of the Council for the ensuing year; in addition to which he shall appoint five members who are not delegates, to act with the committee.

Section 8. The minutes of the Council shall be read in full at the annual meeting of the Association, and its acts, if approved, shall be sustained by a vote of the majority of the members present; or, if disapproved by a majority of the members present, their acts shall be revised, so as to be acceptable to the Association.

Section 9. Incidental business may be called up.

The following articles were then considered seriatim, and, after slight discussion, adopted.

Article XII. The order of business at the second session of each annual meeting shall be as follows:

Section 1. The President shall call the Association to order.

Section 2. The Secretary shall read the minutes of the preceding meeting, which may be amended, if necessary, and shall then be approved.

Section 3. The report of the Committee on Nominations shall be read; when the President shall appoint tellers, and the officers nominated shall be balloted for.

Section 4. The Council shall present names recommended for membership.

Section 5. Reports of Standing Committees shall be read.

Section 6. Reports of Special Committees shall be read.

Article XIII. The order of business for the meetings of the Sections shall be determined by each section for itself.

Article XIV. No money shall be appropriated from the treasury by any of the Sections.

Article XV. At the last session of the Association the newly elected officers of the Association shall take their respective places.

In Chapter I., Article I., after the word "Association," the words "except those of the special sessions as hereinafter provided," were inserted.

Chapter VII was amended to read as follows:

Article I. There shall be six standing committees: A Committee on Commercial Interests, and on the revision of the U. S. Pharmacopœia, each to consist of five members; a Committee on Scientific Papers, a Committee on Prize Essays, a Committee on Legislation, and a Committee on Pharmaceutical Education, each to consist of three members.

Article II. The Committee on Commercial Interests shall be appointed by the Section on Commercial Interests. They shall be charged with the work of arranging in advance the business to come before the Section at the next annual meeting. They shall propose each year a subject for discussion at the meetings of the State Associations, and at the following annual meeting of this Association they shall present a report of the action of the State Associations upon the subject proposed.

Article III. The Committee on Scientific Papers shall be appointed by the Section on Scientific Papers. They shall arrange the business of the Section, and report, near the close of each annual meeting, a proper number of questions of scientific and practical interest, the answers to which may advance the interest of pharmacy, and shall procure the acceptance of as many such questions for investigation as may be practicable.

Article IV. Any person writing a paper for the Association must, to insure its publication in the Proceedings, refer the same, with a synopsis of its contents, to the Committee on Scientific Papers previous to the first session.

Article V. It shall be the duty of every Standing Committee making a report annually to the Association, in like manner to furnish a copy of the same, together with a synopsis of its contents, to the Committee on Scientific Papers, before the first annual session of the Association.

Article VI. The Committee on Prize Essays, which shall be appointed by the Chairman of the Section on Scientific Papers, shall, within six months after the annual meeting at which the essays are presented, determine which, if any of them, has met the requirements of the founder of the prize. In all other respects they shall be governed by the stipulations expressed by the donor. The decision of the Committee, with such comments upon the successful essay only as they may deem proper, may be published in the Journals of Pharmacy.

Article VII. The Committee on Legislation, which shall be elected by the Section on Legislation, shall keep a record of, and compile for reference, the enactments of the different States regulating the practice of pharmacy and the sale of medicines. They shall report to each stated meeting of the Association what legislation on the subject has occurred during the year. They shall arrange the business of the Section in advance of its meetings, and propose suitable subjects for discussion.

Article VIII. The Committee on Revision of the United States Pharmacopœia shall be appointed by the President of the Association. It shall be their duty to collect and codify such facts as may serve as a basis of the report to be presented by this Association to the National Convention for revising the Pharmacopœia. It shall collect statistics regarding the frequency with which officinal and non-officinal remedies are used in legitimate practice, and shall endeavor to ascertain the general wishes and feelings of the profession throughout the country in regard to any desired changes or improvements in the Pharmacopœia.

Article IX. The Committee on Pharmaceutical Education shall be appointed by the Section on Pharmaceutical Education, and it shall be their duty to arrange the business of the Section in advance of its meetings, to propose suitable subjects for discussion, and to attend to such duties of the Section as may be delegated to them.

The only alteration in the foregoing articles from the amendments proposed by the Management Committee was suggested by Mr. Painter, and accepted by the Committee to change at the end of Article IV. the words "third session" to "first session."

The following additions to Chapter VI. were adopted :

To Article I. Any member of the Association may attend the meetings of the Council, and may, by a special vote of the Council, be invited to speak on any subject under discussion.

To Article II. No elected member of the Council, after having served one term, shall be eligible for re-election to the Council to serve the next succeeding term.

Article II., of Chapter I., and Article IV., of Chapter II., were dropped, and Articles III. to X. of Chapter I., were numbered Articles II. to IX. consecutively.

The new Article recommended to be added to Chapter III. was adopted.

Article III. An exhibition of objects interesting to pharmacists shall be held each year, under the direction of the Local Secretary and the Committee on Commercial Interests.

Mr. Remington moved the adoption of the recommendation of the Management Committee, that the American Pharmaceutical Association be incorporated.

MR. REMINGTON.—There are difficulties in the way of incorporating the Association. If it is done, the proper place would be at the District of Columbia.

THE SECRETARY.—I merely desire to state for the information of the Association that the idea of the incorporation of the Association is by no means a new one. It came up thirty years ago, and it has been before the Association since then. At one time a Committee conferred with members of Congress on this subject; but there were difficulties in the way, and very likely the Council will find difficulties now.

The recommendation was adopted.

On motion of Mr. Nicot, the amendments previously adopted *seriatim* were adopted as a whole.

Mr. Good moved a vote of thanks to the Committee on Management, for the able manner in which they have discharged their duties. The acting President having been a member of that Committee, the question was taken by the Secretary, and the motion was unanimously adopted.

On motion of Mr. De Forest, the Committee on Management was discharged.

Mr. Painter offered the following amendment to the By-Laws:

To Chapter IV. add new Article V.

The Treasurer, in order that he may qualify for the office to which he has been elected, shall file a good and sufficient bond or bonds to the amount of $10,000, with the Chairman of the Council, for the faithful performance of his duties as Treasurer. This bond or bonds to be signed and executed by two sureties or trust companies, acceptable to the Council.

Mr. Schafer offered the following amendment:

Substitute for the present Article III., Chapter XI., the following:

"No one or more of these By-Laws shall be suspended," *except by a vote of three-fourths of the members voting.*

Mr. Lemberger offered the following amendment:

Chapter V., Article I:

Strike out the words "such sum as may be annually determined upon by the Council," and insert the words, "an annual sum of $750.00."

These amendments were laid over, under the rules, to a subsequent session.

MR. DIEHL.—This morning I made a motion to postpone action upon the report of the Committee on the time and place of the next meeting. I said that, sir, for a very good reason to my mind, because the report coming so soon after the appointment of the committee seemed to be at least premature. I have since then learned that this committee acted advisedly; furthermore, that it is desirable that the report should be made this day. I therefore move a reconsideration of that vote to postpone.

Mr. Diehl's motion was seconded and agreed to.

Mr. Painter moved that the report of the Committee on time and place of the next meeting be adopted.

The motion was seconded and carried unanimously.

The Secretary read the following telegram:

SIOUX FALLS, DAK., SEPT. 6, 1887.

TO PROF. J. M. MAISCH, *Sec. American Pharmaceutical Association, Cincinnati, O.:*

The South Dakota Pharmaceutical Association, now in session at Sioux Falls, sends greetings to the American Pharmaceutical Association, with wishes for a successful meeting.

J. W. THAYER,
H. P. PETTIGREW.

On motion of Mr. Seabury, the message was received, and the Secretary directed to send a reply.

Mr. Remington moved that the report of the Committee on National Formulary be taken up.

The motion was seconded and adopted.

Mr. De Forest then read the following:

REPORT OF THE COMMITTEE ON NATIONAL FORMULARY.

To the American Pharmaceutical Association:

The propositions of the Committee on National Formulary, laid before the last annual meeting of the Association at Providence, having been adopted, a resolution was passed at the same meeting, continuing the former Committee as a nucleus of the new one, and adding to it one member from every State Pharmaceutical Association, so as to give due representation to every section of the country. The appointments of the additional members were made as promptly as possible, most of them before the end of October, 1886. Immediately after the meeting, the manuscript of the draft of the Formulary was prepared for the press, which involved a great deal of time and labor. In the preparation of this it was of course impossible to aim at uniformity or harmony, either in language, processes, or weights and measures. Indeed, the very great diversity of customs in different parts of the country, or in methods of preparing one and the same compound, could be recognized better by leaving the various contributions unaltered for the time being. As soon as the draft was printed, it was sent to all the members of the Association (in the Proceedings), to all pharmaceutical and the more important medical journals, and to many individuals who had either voluntarily tendered their services, or who were believed to have special facilities for prosecuting certain investigations or experiments. The benefit derived from the issue of the draft, in a printed form, cannot be overestimated, inasmuch as it greatly facilitated reference among the several formulæ, and besides, saved a very large amount of correspondence.

Meetings of the Committee were held weekly at New York, due notice of which was given to the members. It is gratifying to state that great interest was evidenced by the members of the Committee, not only those residing at or near New York, but also those living in other states, either by personal attendance at the meetings, or by contributions of papers or of specimens. The most material aid was rendered to the Committee through the voluntary assistance afforded by special committees representing the College of Pharmacy of the City of New York, the Kings County Pharmaceutical Society of Brooklyn, and the German Apothecaries' Society of the City of New York, who shared among them the very laborious, tedious and often expensive task of trying the various formulæ by actual experiment, and without whose co-operation the Committee could not have completed their work in time for this meeting.

Circulars were sent out from time to time, giving a summary of the more important matters transacted by the Committee. After the draft had been issued, the chairman assigned work to the several members, either on the basis of their own selection, or by referring selected portions to those who had left the choice of these to the chairman. Nearly all the gentlemen who thus accepted tasks performed them with promptness and care, only a few being prevented by unforeseen circumstances, from rendering active assistance.

One of the most important points which the Committee had to decide, in the course of its work, was the final list of preparations which were to be received into the text. In order to arrive at some definite data regarding the practice in vogue in the different States, and also regarding the views of the members, a special printed circular was sent out asking the members to put on record their votes or opinions. On analyzing the result, however, it was found that the local section of the Committee had to use its own discretion and judgment much more frequently than was anticipated. Under these circumstances the Committee carefully considered each case and made a decision based on the best information in its possession. A considerable number of preparations contained in the draft have been dropped, as it was not deemed wise to perpetuate formulas which could not be shown to be of more than a very circumscribed local use.

As the last instalments of contributions from members living in distant States have reached the Committee only quite lately, it has been impossible to have the manuscript of the National Formulary ready for inspection at this meeting. It is, however, in a forward state of completion, and will be ready by the time the necessary arrangements for printing it shall have been made. To afford some idea of the results so far attained, a few selected formulæ are printed in connection with this report.

In order to carry the work to a successful termination, the following propositions are laid before the Association, with a recommendation that they be adopted:

1. The Committee on National Formulary, as at present constituted, shall be continued until the Formulary elaborated by it has been printed.

2. The Council of the American Pharmaceutical Association shall make the necessary arrangements regarding the printing of the work, as soon as possible after the adjournment of the present meeting.

3. The National Formulary shall not be issued as a part of the Proceedings, but shall constitute a separate pamphlet or volume, a bound copy of which shall be furnished to every member of the Association entitled to the Proceedings.

4. The Council shall be empowered to make all requisite arrangements for the sale or distribution of the work.

5. At the next meeting of the Association, a new Formulary Committee shall be appointed, the working nucleus of which ought to be selected from a section of the country differing from that at which the present one is located, and the new Committee should collect information and facts looking to a future revision of the Formulary.

Respectfully submitted,

CHARLES RICE, *Chairman*,
P. W. BEDFORD, *Secretary*,
S. J. BENDINER,
ADOLPH TSCHEPPE,
WM. P. DEFOREST,
Members at Large,

And the following Members, as Representatives of State Pharmaceutical Associations.

Alabama: P. C. Candidus, Mobile.
Arkansas: Jas. E. Gibson, Little Rock.
California: Emlen Painter, N. Y.
Connecticut: C. A. Rapelye, Hartford.
Dakota: Henry L. Warne, Mitchell.
Dist. Columbia: H. E. Kalusowski, Washington.
Georgia: Jesse W. Rankin, Atlanta.
Illinois: C. S. Hallberg, Chicago.
Indiana: Geo. W. Sloan, Indianapolis.
Iowa: T. W. Ruete, Dubuque.
Kansas: R. J. Brown, Leavenworth.
Kentucky: C. L. Diehl, Louisville.
Louisiana: Alex. K. Finlay, New Orleans.
Maryland: Chas. Caspari, Jr., Baltimore.
Massachusetts: W. W. Bartlet, Boston.
Michigan: A. B. Stevens, Detroit.
Minnesota: W. S. Getty, St. Paul.
Mississippi: S. P. Head, Terry.
Missouri: J. M. Good, St. Louis.
Nebraska: N. A. Kuhn, Omaha.
New Hampshire: M. L. Woodman, West Lebanon.
New Jersey: C. B. Smith, Newark.
New York: L. F. Stevens, Brooklyn.
North Carolina: E. V. Zoeller, Tarboro.
Ohio: L. C. Hopp, Cleveland.
Pennsylvania: Chas. T. George, Harrisburg.
Rhode Island: E. A. Calder, Providence.
South Carolina: G. J. Luhn, Charleston.
Tennessee: J. S. Robinson, Memphis.
Texas: E. M. Wells, Fort Worth.
Virginia: C. A. Santos, Norfolk.
West Virginia: Chas. Menkemeller, Wheeling.
Wisconsin: Fred. B. Power, Madison.
Ontario, Canada: E. Gregory, Lindsay.
Quebec, Can.: W. Ahern, Quebec.

10. BOROGLYCERINUM.

[Page 5.]

Boroglycerin.

Glyceryl Borate. Boroglyceride.

Boric Acid, in powder	62 parts.
Glycerin	92 "

Heat the Glycerin in a tared porcelain capsule to a temperature not exceeding 150° C. (302° F.), and add the Boric Acid in portions, constantly stirring. When all is added and dissolved, continue the heat at the same temperature, frequently stirring, and breaking up the film which forms on the surface. When the mixture has become reduced to a weight of *one hundred* (100) *parts*, pour it out on a flat surface previously coated with a very small quantity of petrolatum, let it cool, cut it into pieces and transfer them immediately to bottles or jars, which should be well stoppered.

Note.—When a solution of Boroglycerin is required, it is preferable to prescribe, or to dispense the Glycerite of Boroglycerin (see *Glyceritum Boroglycerini*).

11. CAFFEINÆ CITRAS EFFERVESCENS.

Effervescent Citrate of Caffeine.

Caffeine	20 parts.
Citric Acid	20 "
Bicarbonate of Sodium	600 "
Tartaric Acid	540 "
Sugar, in very fine powder	620 "

Mix the ingredients, previously well dried, to a fine, uniform powder.

If the compound is required in form of a granular powder, mix it with Alcohol to a soft paste, and rub this through a No. 20 tinned-iron sieve, or enamelled colander. Then dry it, and reduce it to a coarse, granular powder.

Ninety (90) grains (or about a heaped teaspoonful) of the above compound represent 1 grain of Caffeine.

12. CAFFEINÆ SODIO-BENZOAS.

Sodio-Benzoate of Caffeine.

Caffeine	50 parts.
Benzoate of Sodium	50 "
Alcohol	a sufficient quantity.

Triturate the Caffeine with the Benzoate of Sodium and a sufficient quantity of Alcohol to a smooth paste, and dry this by exposure in a moderately warm place. Rub the dry mass to powder, and keep it in well-stoppered bottles.

Note.—The product contains 50 per cent. of Caffeine, and is soluble in 2 parts of water.

On motion of Mr. Painter, the report was received, and the recommendations contained therein were ordered to be taken up *seriatim.*

The first recommendation, that the Committee be continued until the Formulary has been printed, was adopted. Likewise the second recommendation, that the Council make speedy arrangements for the printing of the work.

For the third recommendation, Mr. Ebert moved the following substitute:

> The National Formulary shall be issued as a part of the Proceedings, and shall also be printed as a separate pamphlet or volume, a bound copy of which shall be furnished to every member of the Association entitled to the Proceedings.

The substitute was, after some discussion, adopted.

The fourth and fifth recommendations were adopted as presented.

Mr. Painter moved that the National Formulary be copyrighted by Council. The motion was seconded by Mr. Hallberg, and was amended by Mr. Diehl moving that the subject of copyrighting the National Formulary be referred to Council. This motion was adopted by a vote of 42 ayes to 4 nays.

Mr. Canning moved that the report of the Committee as amended be adopted as a whole.

MR. HALLBERG.—After last year's meeting the representatives of the State Associations were kept pretty well informed as to the progress of the work till about the time when the hot weather set in. We received—at least I did, as representing Illinois—reports of the weekly meetings held in New York by the Committee regularly, but afterwards those reports ceased. A circular was sent out about two months ago, I believe, that the reports would be discontinued until the meeting here, and that then the matter would be in such shape that the representatives of the State Associations could see just how the work stood. I know the Committee had a great task before it, but it seems to me these specimen pages do not furnish us much of a clue as to the character of the preparations which have been included in the work, or which are proposed to be included. Now, while we recognize that the original Committee in New York and Brooklyn has done most of the work, and received very little help from outside, at the same time it was the wish of the Association that the States should be represented, and for that purpose they should be tolerably well informed at least upon the character of the preparations to be included, and whether the wishes of the various sections were taken into consideration in compiling the work. I am instructed by the meeting of the Illinois Association, held only two weeks ago, to request at this meeting that in the formulary as many as possible of the proprietary articles be incorporated. These were considered to be really of more importance than the formularies of a lot of old-time elixirs which at least in the Middle States have ceased to be used to any great extent. The pharmacists of Illinois think that we want a formulary containing such preparations as are largely called for, and that we do not want a formulary which contains simply a collection of 40 or 50 of old elixirs which are, I believe, gradually going out of date. Probably half a dozen cinchona preparations or combinations of quinine and iron and the like are still kept in stock: the vast majority of the others are going out of use rapidly. On the other hand, some of the proprietary articles are creeping up, and as shown by the tabulated lists of prescriptions presented to our State Association, some of these preparations are used 10, 20 or 30 times oftener than the most largely-used elixirs, syrups or similar preparations of the National Formulary. There has been a disposition on the part of the members of this Association, and I believe also on the part of the original Committee, to not incorporate formulas for these proprietary articles. But it is against that disposition that I wish to speak. We regard that the formulas of about 10 leading proprietary articles will be of more service to pharmacists than the formulas of at least 50 or 60 old elixirs, and about 40 of the syrups, or preparations of that kind. I would like to hear from the Chairman of the Committee here present what action has been taken in regard to the class of preparations to which I have referred.

MR. PAINTER.—The wishes of every member from the different State Associations and of the individuals that sent reports to the Committee were very carefully considered, with the object to have every one's wishes complied with as nearly as possible. The Committee have continued such preparations which were recommended from different localities throughout the country, although the local Committee did not recommend many of these preparations, and would have dropped them but for the evident wish of certain localities that they should be retained. Many letters had to be written to ascertain why certain preparations should be retained, and out of consideration for the wishes of the localities they were allowed to remain. Formulas for bromidia and other preparations of that character, I suppose, it was not considered wise to adopt, and this seems to be the wish of the country from the reports received, and from the votes on the circulars sent out. The Committee considered carefully these reports, and the votes as to the present use of the preparations in different localities. There was, for instance, an elixir of iron, strychnine and belladonna, and it was not known that such an elixir was ever used. Still there were some votes in favor of it, and the Committee endeavored to ascertain the reason for its introduction, and then we came to find out the only reason was they did not want it.

MR. GOOD.—The question is on the adoption of the report as a whole. I can readily perceive that it is not possible in issuing a work so comprehensive as the National Formulary is to be, for everybody to get just what he wants or all he wants. I think the committee covered these points very nicely in their preliminary remarks here. As a member of the Committee from the outside, I received a sheet asking for a vote on the different preparations, and promptly sent in my vote. I was astonished to find how few of the formulas were really of practical use with us, but I recorded my vote mostly in such a way as to allow them to retain formulas if thought desirable. After this the most important point the Committee have to decide was the final list of preparations to be received into the book. In order to arrive at some idea as to the practice in vogue in different States, and with regard to the views of members, a printed circular was sent out, asking for the vote on this question. On analyzing the result it was found that the local Committee would have to use their judgment more frequently than was expected by those at the meeting of the Association.

MR. PAINTER.—I can vouch for that having been the case. I was present at almost every meeting. I was not one of the original five, but I represented the outsiders.

MR. DEFOREST.—I like to add one word to relieve any impression lingering on Mr. Hallberg's mind that any of the members have been neglected. Of course it was understood in the instructions given to the Committee, that each member could be present at the meetings week after week and watch the progress of the work. Mr. Rice had gone to the trouble of drawing up hektograph reports and sending them out as far as he was able to do so. I do not believe that any member was neglected, and I think that Mr.

Hallberg will be convinced that he has received consideration fully as much as the members of this Committee living in the vicinity where the work has been done. We have been glad when it was possible to have outside members with us; members from other States have visited the meetings of the Committee, and their verdict has been that the work was done with all fairness. Some of them are present here, and I think they will corroborate what I have said.

Mr. Remington.—I have only very few words to say, because I am not acquainted with the inside work of this Committee. Some thought that I was pretty hard on them when I criticized some of the formulas, but so far as honest work on the part of the Committee is concerned, the endeavor of making it as comprehensive as possible, and the consulting of the wishes of every member of this Association, whether on the Committee or not, Doctor Charles Rice has done everything an honest man could do. Mr. President, I appreciate to the full extent the amount of work that he has had to do, and the annoyance he has had in collating and getting together the sense of the druggists of the United States on this subject. He has done it with patience, taking care not only of local interests but the interests of the whole country. I was not on the Committee. I proposed many formulas, and I think the Committee have done as much work and have done it as well as they could.

Mr. Hallberg.—A few words in explanation. I do not wish, as I said in the beginning, to be considered as meaning that Mr. Rice has not done all that he should; in fact, he has done more than was expected even from a man of his well-known integrity. I have no fault to find against the Committee; but I suspected ever since the last meeting that the class of preparations which we in the west desire would not be incorporated.

Mr. Painter.—Some of them are; and the wishes from every section were met as far as the Committee could.

Mr. Hallberg.—But you should have the preparations more largely used.

Mr. Painter.—You cannot put in everything.

Mr. Hallberg.—I have been instructed by my Committee right along on this subject. It is a vital point. That is the kind of preparations we want formulas for. If we do not get them, some other Formulary is going to be sold to the druggists in the State of Illinois.

Mr. Whelpley.—From this interesting discussion we have learned that the West prescribes, and the citizens take, a large amount of proprietary medicines. As I understand, the National Formulary is not as dignified as the Pharmacopœia. It is made for the druggist, as a hand-book for him to supply preparations that he is dispensing every day. We know that most of the labor is being done by the Eastern members. Being done by them, they naturally incorporate in that Formulary those preparations that are dispensed to the greatest extent in the East.

Mr. DeForest.—That does not follow absolutely.

Mr. Whelpley.—They have not incorporated formulas for proprietary preparations. Now the natural inference is that the East do not use them, while the West is living on them.

Mr. Bedford.—And dying on them.

Mr. Canning's motion that the report of the Committee on National Formulary, as amended, be adopted as a whole, was agreed to.

The Secretary read the following communication:

CINCINNATI MUSEUM ASSOCIATION, 9, 6, 1887.

J. U. LLOYD, PRESIDENT AMERICAN PHARMACEUTICAL ASSOCIATION, CITY:

Dear Sir.—We shall be pleased to have the members of the Pharmaceutical Association visit the Art Museum. They will be admitted at any time during the hours of opening by showing their badges at the door.

Yours respectfully,
A. T. GOSHORN, *Director.*

On motion of Mr. Macmahan the invitation was accepted with the thanks of the Association.

Mr. Remington explained the order of business under the new rules, and on motion of Mr. Hallberg the meeting adjourned until the following morning at nine o'clock.

THIRD SESSION.—WEDNESDAY MORNING, SEPTEMBER 7TH.

President Lloyd called the meeting to order at the appointed time. The minutes of the second session were read by the Secretary, and on motion, were approved.

The Secretary of Council announced that the twelve applications for membership reported at the second session had been acted on and that the applicants had been elected by Council.

Willis H. Albro, Medina, O.
Mark A. Burkhardt, Dayton, O.
D. S. Carraway, Chattanooga, Tenn.
Emil A. Fischer, Cleveland, O.
Sigismund J. F. Hahn, Cleveland, O.
De Laignel Haigh, St. Louis, Mo.
Justin S. Hill, Williamsport, Pa.
George Hughes, Jacksonville, Fla.
James Kennedy, San Antonio, Tex.
Thad. D. McFarland, Canton, O.
Theodore F. Norwood, Cincinnati, O.
John Weyer, Cincinnati, O.

Mr. Kennedy also read the names of 107 persons duly recommended for membership in accordance with the requirements of the By-Laws.

On motion of Mr. Canning, these were invited to become members.

The Association then adjourned, and the Section on Commercial Interests convened.

FOURTH SESSION.—WEDNESDAY NOON, SEPTEMBER 7TH.

Preceding the opening of the second session of the Section on Commercial Interests, the Association did not transact any business.

FIFTH SESSION.—WEDNESDAY AFTERNOON, SEPTEMBER 7TH.

The meeting was opened with Vice-President Alexander in the chair.

The Permanent Secretary read the minutes of the third and fourth sessions, which were approved, when the Association adjourned, and the Section on Scientific Papers convened.

SIXTH SESSION.—THURSDAY MORNING, SEPTEMBER 8TH.

President Lloyd called the meeting to order at the appointed time.

The minutes of the fifth session were read by the Secretary, and on motion were approved.

Mr. Kennedy read the names of 68 persons recommended for membership, as required by the By-Laws.

On motion, these persons were invited to become members.

SEVENTH SESSION.—THURSDAY NOON, SEPTEMBER 8TH.

No business was transacted by the Association preceding the opening of the third session of the Section on Scientific Papers.

EIGHTH SESSION.—THURSDAY AFTERNOON, SEPTEMBER 8TH.

Vice-President Simmon took the chair.

The Secretary read the minutes of the sixth and seventh sessions, which were approved. The Association then adjourned to give way to the Section on Pharmaceutical Education.

NINTH SESSION.—FRIDAY MORNING, SEPTEMBER 9TH.

President Lloyd called the meeting to order. The Secretary read the minutes of the eighth session, which were approved.

The Secretary of Council read 269 names of pharmacists who were recommended for membership as required by the By-Laws, and on motion were invited to become members.

Mr. Kennedy also read the minutes of the Council, which give the following information :

NINTH SESSION OF COUNCIL, ODFON, SEPT. 6TH (6 Members Present).

Twelve candidates were elected members (the names were recorded at the third session). The Chairman read a letter from ex-Treasurer Tufts in which he states:

"When I received the report of the Auditing Committee I was greatly surprised at the amount apparently due from me to the Association. I received the notice for payment of the amount claimed and at once began to make preparations to cancel it. I regret that I could not do so earlier, but am greatly relieved that I have paid it all, and have the receipt of the Treasurer for the same."

TENTH SESSION OF COUNCIL, ODEON, SEPT. 7TH (12 Members Present).

The names of 107 pharmacists, recommended by members, were presented and directed to be reported to the Association.

On motion of Mr. Sheppard, seconded by Mr. Alexander, the Chairman of the Committee on Membership was directed to refund $2 to all members who, at the present meeting, were elected under the old system.

A resolution presented by Mr. Sheppard that it is the sense of the Council that the National Formulary be *not* copyrighted, was laid on the table for future consideration.

ELEVENTH SESSION OF COUNCIL, ODEON, SEPT. 7TH (8 Members Present).

On motion of Mr. Ebert, Mr. Sheppard's motion was taken from the table and considered. Mr. Diehl moved as a substitute for the resolution, that the National Formulary *be* copyrighted. Messrs. Bedford and DeForest being present were invited to state their views. Mr. Ebert called for the ayes and nays, when Mr. Diehl's motion was carried, Messrs. Gordon, Rogers, Maisch, Diehl, Kennedy, Lloyd and Thompson voting aye; Mr. Ebert voting nay. The motion as amended was then adopted.

A motion to reconsider the vote at the seventh session of Council, referring the special report of the Publication Committee to the next Council, was carried, and on motion of Mr. Maisch, the report was referred to the Section on Scientific Papers.

The recommendations of 68 pharmacists for membership were examined.

TWELFTH SESSION OF COUNCIL, GRAND HOTEL, SEPTEMBER 8 (9 members present).

The recommendations of 269 pharmacists for membership were examined.

The amendment to Chap. V. Art. II. of By-laws of Council, offered by Mr. Ebert at sixth session, was adopted.

A list of members in arrears was presented by the Treasurer, and the names were ordered to be dropped from the roll.

On motion of Mr. Sheppard, Mr. A. H. Hollister was authorized to settle with F. S. Fenton, of Beloit, and F. Prentice, of Janesville, Wis., who are five years in arrears, in a manner that seems best in his discretion, and retain them, if possible, as members of this Association.

A committee of three, consisting of Wm. S. Thompson, S. A. D. Sheppard and J. M. Maisch, was appointed to consider the question of incorporation, and report to the chairman of the Council.

On motion of Mr. Sheppard, it was resolved that the copyright which is to be taken for the National Formulary, shall not be used to prevent the reprinting of any or all of the unmutilated formulas.

The Minutes of Council were approved.

Vice-President Alexander took the chair.

Mr. Diehl read the introductory portion of his Report on the Progress of Pharmacy, which was accepted and with the report referred for publication (see pages 1–9).

The Secretary read the report of the Committee on the Drug Market.

Mr. Hallberg moved that the editor be directed to change the names of drugs in accordance with pharmacopœial nomenclature. The motion was opposed by Messrs. Merrell, Ebert and Lyons, while Mr. Good expressed himself in favor of the change.

The question being taken, the motion was lost.

Mr. Carraway offered the following:

WHEREAS, Several State Pharmaceutical Associations have refused to admit female applicants to membership, be it

Resolved, That the American Pharmaceutical Association extends the right hand of fellowship to female Pharmacists, and cordially invites them to join our ranks.

Mr. Brown said that the Association had, years ago, practically decided this question, and moved to lay the resolution on the table, which was agreed to.

The following report was read, and on motion, received, and the recommendation adopted:

Mr. President.—Your Committee, to whom was referred the address of the presiding officer, will respectfully report that they have examined the same, and while it contains no recommendations to which they call your attention, they would suggest that the thanks of the Association are eminently due to the Vice-President, who so loyally came to the front, furnishing us an address and presiding over our deliberations with great ability.

Signed by the Committee, E. A. SAYRE,
H. M. WHELPLEY.

The supplementary report of the Nominating Committee was read as follows:

Mr. President.—Your Nominating Committee would report that at a second session, held at the Grand Hotel, the following named gentlemen were by the unanimous vote of the Committee placed in nomination for offices to which their names are appended:

For Council—J. M. Good, St. Louis, Mo.; L. C. Hopp, Cleveland, Ohio; W. Dupont, Detroit, Michigan.

For Local Secretary—James Vernor, Detroit, Michigan.

Respectfully submitted, GEORGE J. SEABURY, *Chairman.*
E. A. SAYRE, *Secretary.*

The Chair appointed Messrs. DeForest and Nicot tellers.

On motion of Mr. Macmahan, the ballot was taken for three members of Council, and the tellers reported the election of Messrs. Good, Hopp and Dupont.

On motion of Mr. Brown, the Secretary was directed to deposit an affirmative ballot in favor of Mr. James Vernor as Local Secretary. This being done, Mr. Vernor was declared duly elected.

The Secretary read the credentials from the National Wholesale Drug Association, accrediting Messrs. George Merrell, Samuel J. Hale, Daniel Myers, Eli Lilly, and Geo. J. Seabury a Committee to visit this Association. The credentials were, on motion, accepted, and the courtesies of the floor were extended to the gentlemen.

An invitation from Mr. Th. F. Norwood, for the members to visit his new store on Walnut Hill, was read. It was accepted with thanks.

The Secretary read the following telegram:

TO THE AMERICAN PHARMACEUTICAL ASSOCIATION, IN SESSION IN CINCINNATI:

"The St. Louis Club of Microscopists, in meeting, send greeting to the American Pharmaceutical Association.

(Signed) "J. C. FALK, *Vice-President.*"

On motion, the communication was received, ordered to be spread on the minutes, and the Secretary was instructed to send a suitable reply.

The Secretary also read the following telegram to the Dakota Pharmaceutical Association, in compliance with the instruction at the second session:

"TO J. W. THAYER AND P. PETTIGREW, SIOUX FALLS, DAKOTA:

"The American Pharmaceutical Association acknowledges greeting received, and sends hearty wishes for success of the South Dakota Pharmaceutical Association."

Mr. Remington offered the following resolution:

Resolved, That the sum of $75, or as much thereof as is necessary, be appropriated for the expenses of the Formulary Committee for finishing their report.

MR. DEFOREST.—The report of Council shows that money has been appropriated for the Formulary Committee; but it should go on record that that money has never been sent to the Treasurer of the Formulary Committee.

The resolution was adopted.

Mr. Seabury offered the following resolution:

Resolved, That the Association award annually three prizes for the three most practical papers read before the Scientific Section, aggregating the sum of $150, and apportioned as follows: $75 for the first, $50 for the second, and $25 for the third prize. The awards to consist of funds, apparatus, chemical or pharmacal literature, the choice to be optional with the winners; all essays or papers to be marked on title page, "For competition," so as to separate them from volunteer papers not offered in competition. And further

Resolved, That a committee of five be appointed, who shall decide upon the relative merits of such papers.

The motion being seconded, Mr. Thompson moved that the resolutions be referred to the Section on Scientific Papers, the appropriation of money to be deferred until the resolutions had been endorsed by that Section.

The motion to refer was lost, and the original motion was then carried.

President Lloyd in the chair.

Mr. Duble moved that the Committee on Management be continued for another year. The Committee having been discharged by vote of the

Association at the second session, Mr. Canning moved that that vote be reconsidered. This was agreed to, and Mr. Duble's motion was then adopted.

Vice-President Alexander in the chair.

The following resolution, offered by Mr. Sloan, was adopted:

Resolved, That the thanks of this Association be extended to the Local Secretary, Mr. Geo. W. Voss, for the excellent manner of his arrangements.

Mr. Schafer's proposition, offered at the second session, to amend Art. III., Chap. XI., of the By-Laws by adding to it the words "except by a vote of three-fourths of the members present and voting," was called up.

Mr. Canning moved to amend by substituting for the amendment the words "except by unanimous consent."

Messrs. Sheppard, Hechler, Remington and Whelpley spoke against the amendment, and Mr. Macmahan moved to lay it on the table, which was seconded and adopted.

Mr. Lemberger's amendment to Chap. V., Art. I., offered at the second session, was considered, and, on motion of Mr. Thompson, adopted, making the article read, "and shall receive from the Treasurer for his services an annual sum of $750."

Mr. Painter's amendment to Chapter IV., new article, offered at the second session, was read and adopted as follows:

The Treasurer, in order that he may qualify for the office to which he has been elected, shall file a good and sufficient bond or bonds to the amount of ten thousand dollars with the Chairman of the Council for the faithful performance of his duties as Treasurer; this bond or bonds to be signed and executed by two sureties or Trust Company acceptable to the Council.

Mr. Remington, on behalf of the Committee on Management, offered the following:

Resolved, That the sessions of the Sections to take place on Thursday during the week of the next annual meeting may take place simultaneously.

MR. REMINGTON.—As it was necessary to designate the days upon which to hold the sessions, the Committee think that it would be well to try the experiment of having three sections meet simultaneously. On Thursday there would probably be an adjourned session of the Section on Scientific Papers and a session each of the Sections on Pharmaceutical Education and on Pharmaceutical Legislation.

The motion was agreed to.

Mr. Macmahan moved that a vote of thanks to the Local Secretary, Mr. Voss, having been very properly passed, the thanks of the Association be now tendered to his associates, the local members of the Committee of Arrangements, Messrs. Wells, Merrell, Rendigs, and Fennel. The motion was adopted.

Mr. Canning made a motion that the Proceedings be published by

January. The Secretary stated that resolutions like that passed last year were considered mandatory until repealed. No action was taken.

The printing of papers previous to the meeting was discussed, chiefly in regard to the expense incurred thereby, but no motion was made.

The Committee from the National Wholesale Drug Association was introduced.

Mr. Merrell.—Mr. Chairman and Gentlemen: In the construction of this Committee from the National Wholesale Drug Association a serious mistake was made in naming me the chairman instead of the eloquent Mr. Seabury, of New York. Nevertheless, we have to accept the situation as we find it. The credentials of this delegation came to me in a very informal manner, and have been presented in due form and accepted by you. The delegates who creditably represented your body at Boston gave us an excellent address, and I only regret that the National Wholesale Drug Association is not so represented by the chairman as to be able to respond properly. I can express to you, however, as the sentiment of that body, that the interests of both Associations are becoming so closely connected and cemented by this continued fraternal greeting that it will not be long before we will have to come together, take each other by the hand, and say each man to the other how much we enjoy this pleasure of each other's acquaintance. The National Wholesale Drug Association is an outgrowth, as you are aware, of what was formerly the Western Wholesale Druggists' Association, and it seems peculiarly fitting that Cincinnati, where your Association has altered its organization, and where it has taken upon itself a form fitted to do a greater amount of work—that Cincinnati should have been the home and the birthplace of that organization which is now the National Wholesale Drug Association. It was in the back room of the Gibson House about twelve years ago, that a few gentlemen of this vicinity met and formed the Western Association, and from it grew the present body. At Indianapolis it started with 100 members. It now numbers nearly 400 members. At first its work seemed to be confined entirely to what appeared to be class legislation. Now it gives its attention to business methods, and not to special class methods, having a selfish end of the individual in it; on the contrary, it labors for the benefit of the entire wholesale drug fraternity, and we claim also for the benefit of those in the retail trade. While in the early history of this Association it has given its attention almost entirely to trade methods and to trade matters, it is now turning its attention in a very large degree to the higher aim of such a body, to the correction of the evils of adulteration and sophistication, and of those methods which seem to lower instead of elevating the business. Your work is of a similar nature, and I congratulate you upon the change which has been made in the methods of this body, whereby all subjects bearing upon the trade shall receive due consideration. You can no more expect that this Association will thrive by giving its attention only to scientific matters, than you can expect the human body to thrive by feeding only the brain and lungs. You must feed the foundations upon which the body rests, and this you will be doing in your commercial section, where you pay attention to the financial basis, thereby enabling you to give greater attention to the higher duties which your profession involves. Gentlemen, these are a few practical thoughts as they force themselves upon me. Mr. Seabury is the poetical member of the Committee—I would like you to call upon him.

Mr. Seabury.—Mr. President, I think that Mr. Merrell has fully covered the ground. If I attempt to enter into the realms of Orpheus I will be completely lost, for the simple reason that ever since we have been in this harmonious hall we have been surrounded by music, and the deliberations of the sections have not been without it; there has been nothing but harmony, outside of a few insignificant little bubbles In the Trade Section a feeling has been displayed similar to that of the National Wholesale Drug Association in Boston. Having organized yourselves by state representation, you have nationalized yourselves, and now instead of having a representative from 38 or 40 states, you can send a Committee and it represents the American Pharmaceutical Association. The origin of the National Wholesale Druggists' Association undoubtedly was to prevent the trade from going into bankruptcy. They were selling goods so cheap that it was a question whether on remaining in the drug business they could pay 25 cents on the dollar. They came together like men, and the only mistake they made was in calling their association the Western Wholesale Drug Association: but they soon changed that. One said to the other, What do you think of the name? And some one said, I think it is a very poor one—I would have the name very different from that. The question was asked, What would you call it. and the reply was, An association for the prevention of cruelty to western interests. And that is just what it was. But the men were in earnest, and in a few years they nationalized themselves, and instead of confining themselves to one matter, now they have about 15 or 20 committees on trade interests, proprietary goods, membership, commercial travelers, transportation, legislation, paints, oils, and glass, adulteration, fire insurance, credits and collections, drug market, fraternal relations, and others.

And right here I would like to make a suggestion. If this Association wishes to place in its annual Proceedings a complete report of the drug market, such as no retail druggist can compile, it may be well to use the report made by the N. W. D. A. They have been talking about mutual fire insurance for four or five years, until finally they have agreed to establish it. I do not know how soon the retail druggists may come into their company, but no doubt it will be done within a few weeks. Mr. Remington says that it is now in operation in Philadelphia. We have gone through our trials and tribulations, and this year the Wholesale Association agreed to entertain themselves. They adopted the plan of our Association of entertaining themselves, and in order to prove it they went to Saratoga. That only proves that while we may be a little late in some things, we are early in others. Now, Mr. President, I congratulate you upon the good work which this Association has done in re-organizing, and I am satisfied that the future will show much better work; and I honestly believe, with more heart, with more zeal, and more progress than it ever has in the past. I say that simply as a critic representing the N. W. D. A. I thank you.

THE CHAIR.—I will appoint Mr. Remington on behalf of the Association to reply to the Committee of the N. W. D. A.

MR. REMINGTON.—Mr. Chairman, I think that duty should devolve upon you. However, I will respond to the cordial sentiment which seems to exist between these two Associations. The N. W. D. A. is the younger of the two Associations, the A. P. A., I think, being twice as old as the N. W. D. A. It gives me a great deal of pleasure to feel that in the organic law of the N. W. D. A. they have seen fit to adopt some of the provisions and regulations which are now in force in our Association. I sincerely hope that this interchange of courtesies between the two Associations will go on; there should be no friction, but there should be a perfect harmony of both interests—of all that is good in the wholesale body as well as what is good in our own Association. I do not agree with one of the members of the Committee when he says that this Association is a retail druggists' Association. The A. P. A. embraces all. We have, I am very happy to say, a large number of members who are in the wholesale business. They have been earnest members, and have labored earnestly to promote harmony and the best interests of both Associations. Gentlemen, I hope that there will be a committee to visit the Wholesale Association, and that the Committee will go with the feeling that there should be perfect harmony between the two Associations. I am certain the history of the past will also be the history of the future, and that they will be received with open arms by the Wholesale Drug Association, and very cordially.

Mr. Macmahan moved that a Committee of five be appointed to visit the National Wholesale Drug Association at its meeting at Saratoga. The motion was agreed to, and the President appointed Messrs. J. P. Remington, Geo. Merrell, A. B. Huested, C. S. Hallberg, and W. P. DeForest, said committee.

Mr. Macmahan moved that the Association give the Committee on Commercial Interests authority to offer a prize or prizes—either a certificate or medal—for exhibits showing greatest progress, and that a sum not exceeding fifty dollars be appropriated for this purpose. The motion was seconded and agreed to.

Mr. Colcord moved a reconsideration of the vote fixing the date of the next annual meeting. This was agreed to, and, on motion of Mr. Remington, the subject was referred to the Council, with power.

Mr. Lemberger moved that the Local Secretary be the Chairman of the Committee on Arrangements, with power to select his colleagues. The motion was agreed to.*

Mr. Colcord referred to the expense possibly arising from the contemplated exhibition. Mr. Macmahan stated that the Association would not be at any expense.

Mr. Klie offered the following resolution, which was adopted:

Resolved, That the Permanent Secretary is hereby instructed to present a copy of the Proceedings of this Association to each of the State Associations.

A motion of Mr. Canning that the Committee on Commercial Interests be instructed to confer with the National Wholesale Drug Association in regard to mutual fire insurance was adopted.

Mr. Whelpley stated that the Section on Scientific Papers had passed a resolution recommending the printing, by the Association's printer, of papers for use at the annual meeting; this course involving an additional expense, he moved that the Association sanction that recommendation, which was agreed to.

A meeting of Council having been called at this time, Mr. Remington was requested to act as temporary chairman, and Mr. Duble as temporary secretary.

Mr. Canning moved that the Council make formal announcement in the Proceedings as to the time of the next annual meeting. The motion was modified by Mr. Macmahan so as to read:

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* Mr. Vernor has appointed Messrs. Theodore Ronnefeld, David O. Haynes, and Frank Inglis, of Detroit, and Thos. J. Macmahan, New York, members of the Committee on Arrangements.—SECRETARY.

Resolved, That when we adjourn, we adjourn to meet in the city of Detroit, at such time as shall be announced by the Council in the Proceedings.

This was adopted, likewise the motion of Mr. Hechler, tendering the thanks of the Association to His Honor, the Mayor, and to the ladies and citizens of Cincinnati for the uniform kindness received at their hands.

Mr. DeForest moved, seconded by Mr. Hallberg, that the Council have printed the reports of the officers and committees to the annual meeting so far as it be found possible.

The motion was opposed by Mr. Sloan on account of the additional expense, and by Mr. Colcord because but few of the reports would be ready in time to be printed. The motion was adopted.

Mr. Hallberg moved that no pharmaceutical journal or other publication have access to the papers or documents of this Association in advance of the annual meeting. Agreed to.

Vice-President Alexander occupied the chair, and the Permanent Secretary resumed his duties.

Mr. Kennedy read the minutes of the Council, which were approved. These minutes of the first session of the new Council give the following information:

FIRST SESSION OF THE COUNCIL, ODEON, SEPTEMBER 9. (12 members present.)

The following officers and committees of Council were elected:

Chairman, Wm. H. Rogers; *Vice Chairman*, Karl Simmon; *Secretary*, G. W. Kennedy.

Committee on Membership.—G. W. Kennedy, *chairman*, A. E. Ebert, P. C. Candidus, A. K. Finlay, Wm. Dupont, and the Permanent Secretary and Treasurer, *ex officio.*

Committee on Finance.—M. W. Alexander, *chairman*, J. M. Good, A. H. Hollister.

Committee on Publication.—C. L. Diehl, *chairman*, J. U. Lloyd, L. C. Hopp, A. E. Ebert, J. M. Maisch.

Committee on Centennial Fund.—J. U. Lloyd, *chairman*, M. W. Alexander, and J. M. Maisch.

On motion of Mr. Maisch the adoption of the title for the National Formulary was referred to the Committee on Publication, in conjunction with the National Formulary Committee.

On motion of Mr. Kennedy it was

Resolved, That the contract for printing and binding the Formulary shall be awarded by the Council to the lowest and best bidder for good work, and that it shall be put on sale by the Council in the various cities of the United States at the lowest price possible after paying all necessary expenses.

Resolved, That the duty of carrying out the above resolution be assigned to the Committee on Publication.

On motion of Mr. Sheppard it was

Resolved, That the Committee on Membership be instructed to send, previous to the next annual meeting, a circular to each member of the Association, calling his attention to the change in the method of receiving new members, and urging his active co-operation in the effort to increase our membership from the best class of pharmacists.

On motion of Mr. Kennedy, the time for holding the sessions at the meeting in Detroit was fixed as follows:

General Sessions.—First, Monday at 3 p. m. Second, Tuesday at 9 a. m.

Commercial Interests.—Third, Tuesday at 3 p. m. Fourth, Tuesday at 8 p. m.

Scientific Papers.—Fifth, Wednesday at 9 a. m. Sixth, Wednesday at 3 p. m. Seventh, on Thursday.

Pharmaceutical Education and Pharmaceutical Legislation.—Eighth, on Thursday.

General Session.—Ninth, Friday, 9 a. m.

On motion of Mr. Lloyd the following rule was added to the General Rules on Finance: Rule *11*. The expense of the bond of the Treasurer given by a trust company shall be paid from the Treasury.

On motion of Mr. Alexander the Committee on Publication was empowered to decide upon the number of copies to be printed of the Proceedings and of the National Formulary.

On motion of Mr. Thompson, the Committee on Management was authorized to make such verbal changes in the amended By-Laws as may be necessary.

No further business being presented, the Secretary read the minutes of the ninth sesssion, which were approved; and the Association, on motion of Mr. Remington, adjourned to meet next year in Detroit, at such time as may be decided upon by the Council and published in the Proceedings. JOHN M. MAISCH, *Permanent Secretary.*

ENTERTAINMENTS.

A number of members arrived in Cincinnati on Saturday and Sunday preceding the first session, and were hospitably entertained by the local pharmacists. The entertainments projected by the Arrangement Committee consisted of a reception and promenade concert at the Grand Hotel on Tuesday evening, and an instrumental and vocal concert at Music Hall on Wednesday evening. On Thursday evening, the members enjoyed the splendor of the grand spectacular drama, "Rome under Nero," with its vast arena, chariot races, combats, processions, etc., terminating with the conflagration of the Eternal City. On Friday afternoon a large number of carriages conveyed the members to various places of interest in the beautiful suburbs of Cincinnati, this portion of the programme terminating with a visit to the Zoölogical Garden, where dinner was served to the entire party. The visiting ladies were most of the time taken care of by the Local Ladies' Committee, Mrs. J. D. Wells (since then deceased) chairman, who with her efficient associates left nothing undone to make the stay of the visitors both profitable and enjoyable. Numerous visits were made to attractive localities and to various industrial establishments, and occasionally impromptu meetings for social intercourse took place. After adjournment a large party went to the Mammoth Cave of Kentucky, and traveled many miles underground to examine the subterranean wonders.

MINUTES

OF THE

SECTION ON COMMERCIAL INTERESTS.

CINCINNATI, SEPT., 7, 1887.

On motion of Mr. R. J. Brown, Mr. M. W. Alexander was elected temporary chairman.

Mr. E. A. Sayre nominated Mr. A. H. Hollister, of Wisconsin, for chairman, and on motion of Mr. Henry Canning the temporary chairman cast an affirmative ballot, and Mr. Hollister was declared duly elected.

Mr. Nicot nominated Mr. J. W. Colcord, of Massachusetts, for secretary, and Mr. Remington nominated Mr. W. H. Rogers, of New York. A ballot resulted in the election of Mr. Colcord by a vote of 48 to 46. On motion of Mr. Rogers the vote was made unanimous.

Messrs. Canning and Good were appointed to conduct the officers to the platform. Mr. Hollister being introduced remarked:

Gentlemen of the American Pharmaceutical Association: Allow me to say that in accepting this position I do it in consideration of the fact that you concede it to me as the President of the National Retail Druggists' Association, and I thank you for this honor. From my very first connection with the two Associations, at Milwaukee, I felt thoroughly convinced that there should be no necessity for the two Associations, and upon several occasions I stated this thought, and later on I did what I could to promote the merging of the two Associations. The work done by the Committee on Management who had this matter in charge has been very ably done, and I believe that the adoption of this change will mark an epoch in the history of this Association that shall produce in its results greater good than heretofore. I believe that this Association is now established upon a proper basis. It is broad enough to take in this entire continent, as it naturally should, and it is vast and deep enough, and thus doubly rooted in our profession, so that as the years go on it will call to it many more men than we have at present.

Now do not make the mistake of thinking that this Association will run itself, or that the officers ought to do all the work; but let the gentlemen of ability, of standing and of usefulness in the different State Associations, see the necessity of not only being present at the meetings of this Association as they shall occur in the future, but likewise of securing the cooperation of other men upon your right and your left hand who ought alike to be interested with you. The prosperity of this Association is within your own hands, and I trust that no one will go out from this meeting without resolving to do what he can; that you all shall take with you a feeling of pride in the position that the

Association has taken, and that by your personal efforts you will seek to interest others to become members of this Association, who shall bring to it and to its meetings thoughts of interest and illustrations of work from the various localities, that may result to the benefit of this entire continent. Again I thank you for this distinguished honor.

Mr. Colcord, the Secretary elect, was introduced.

MR. COLCORD.—Mr. President and Gentlemen: In some of our religious orders the chief business of the clerk is to say amen to the discourse of the pastor. I heartily say amen to the discourse you have listened to, and I think it is a good one. I now wish to propose to you the old motto, "God speed the right." Those of my friends who have been corresponding with me during the past three or four years now will echo this sentiment; and no doubt they will rejoice when I tell them that I have recently purchased a type-writer and have managed to finger it pretty well, almost well enough to play a tune upon it, and I promise you more legible communications in the future than you have received in the past. Gentlemen, I thank you.

Mr. Sayre moved that the Section adjourn for fifteen minutes to allow the National Retail Druggists' Association to meet and adjust its affairs, disorganize and report acceptance of reorganization. The motion was not accepted.

Mr. Merrell presented an invitation from Messrs. Proctor & Gamble to visit their soap works at Ivorydale, and suggested that it would be convenient that those who desire come the present afternoon.

On motion of Mr. Alexander the invitation was accepted with thanks, and the Secretary was instructed to notify that a visit would be made at earliest convenience.

Mr. Merrell presented credentials of delegates from the National Wholesale Drug Association, and they were referred to the Permanent Secretary of the Association.

Mr. Rogers moved that the Section take a recess. An amendment was offered by Mr. Painter that it be an adjournment instead of a recess.

The motion as amended was carried.

SECOND SESSION.

When the Section reconvened, Mr Canning moved that the committee of five on Commercial Interests, including the chairman and secretary, be now elected. Carried.

On motion of Mr. Painter, seconded by Mr. Whelpley, the chairman was requested to nominate three members. Carried.

Messrs. Sayre, of New Jersey, Rogers, of New York, and Finlay, of Louisiana, were presented by the chair, and the secretary was instructed to cast an affirmative ballot for the nominees, and did so.

Mr. Canning moved that the Committee on Commercial Interests be instructed to confer with the National Wholesale Drug Association and the various State Associations with reference to memorializing Congress to remove the $25 internal revenue liquor license and the tax on alcohol. The motion was seconded by Mr. Brown.

MR. THOMPSON.—I suppose what I am going to say may not be very well received by all the members of the Association; still I believe it myself, and am going to say it. That is, the druggists in looking at this matter from a commercial standpoint have constantly in view the fact that the government inflicts upon them as a class a great wrong in requiring them to pay $25 for the privilege of dealing in spirituous liquors. As a matter of fact the government does not impose a license of $25 upon druggists as such. There is a license required of $25 from every person who deals in spirituous liquors. Now if a druggist choose to deal in spirituous liquor he should be perfectly willing as a druggist and as a citizen of this country to bear his portion of the tax. There are certain persons who depend entirely upon the sale of liquor for the sustenance of their families—that is their only business. Now the sale of spirituous liquors is not the druggist's only business, it is merely incidental; he is not obliged to sell liquors. But if he elects to do it in the judicious exercise of his duties he ought to pay the tax the same as any other citizen and say nothing about it. I am opposed as a druggist to vote for asking the Legislature of this country that we as druggists may have the right to deal in spirituous liquor without a license. There is no reason for it at all. We are not obliged to keep brandy on sale any more than we are to keep ale, raw meat, and many other things which the sick man may need at times. We should not ask to be made a privileged class, to deal in something which contributes towards the revenue of the government, unless we are willing to do it just exactly as the law requires. In my opinion it would do far more to elevate the standard of pharmacy, if instead of going to Congress to beg that we might have the privilege of selling liquor without a license, we were to ask Congress to pass a law that no man who regards himself as a pharmacist should be allowed under any circumstances to deal in spirituous liquors.

MR. NICOT.—I am astonished at the remarks of Mr. Thompson, and I judged when I heard them that he was laboring under a misapprehension. I judge also that he sells liquor in his pharmacy, and that he is paying $25 for this privilege. The tax of $25 is not a license, but is a tax on all who deal in spirituous liquors; not necessarily liquors like wines, or taken as a beverage, but upon alcohol, which is absolutely indispensable to the pharmacist. He must use it and must deal in it, whether he sells wines, whisky and brandy or not; he is obliged to pay this tax for the privilege of using the alcohol.

MR. THOMPSON.—Not for the privilege of using alcohol.

MR. NICOT.—For the privilege of selling it.

MR. SCHAFER.—I move to amend by inserting after alcohol the words, "when used for the actual necessities of medicine."

MR. CANNING.—Whilst being in perfect accord with a great deal that was said by Mr. Thompson, I think the amendment of Mr. Schafer just covers what I wanted in my original motion to convey. My motion was drawn up hurriedly, and this last amendment is so good that I cheerfully accept it.

MR. CARRAWAY.—I cannot see the necessity for a druggist selling liquor of any kind. In Tennessee, in addition to paying $25 United States tax, we have to pay $300 annually if we sell liquors on a physician's certificate, and we all get along very well. I do not see the necessity for anybody desiring a change. It is a fact that many drug stores are nothing more than bar-rooms.

Mr. Barnum.—Three or four years ago I concluded not to adorn my store with a liquor dealer's license, and we succeeded quite comfortably. We handle, only for mechanical purposes, good alcohol. Of course, for some months we had considerable inconvenience from the detectives tracing up packages of alcohol, and wanting to know what became of it. They could not understand how the party purchasing alcohol could use it and not sell it. In the cases which sometimes occur, where spirits are required on a prescription, we take the party's money, send to the saloon keeper's, and hand it out. If, however, the party is one who keeps an account, and does not have the money, it is procured, and the amount is placed on the account. These instances have occurred, I think, only three or four times in the year. In my humble opinion, the use of stimulants in a drug store is one of the leading evils connected with the business. It is a curse to us, and no profit to us as merchants.

Mr. Canning.—The gentleman has made some remarks very *apropos.* But very frequently a physician orders liquor in urgent cases, and writes a prescription for it. I don't feel like my neighbor here about trusting to the nearest liquor store to dispense it. I cannot vouch for what he may take. While I have been in business on my own account no liquor in any form has gone out of my store except on a *bona fide* prescription of a physician, but I do not want the United States to say I should pay $25 for this privilege. I say it is unjust that a man—and there are many of us conducting business in that way to-day—should be obliged to be placed on the same level with a corner groggery; and we should rise up as one man and demand the repeal of that law.

Mr. Duble.—Mr. Chairman, I do not know but what I would concur in the resolution if I could see any good results from its passage. I agree with our friend in the injustice of the tax and the humiliation of being classed as a retail liquor dealer, nevertheless I do not believe in making the effort unless there is some certainty of accomplishing some good. I have been in correspondence with parties able to give me some advice, and I know quite a proportion of the larger pharmacists of the State of Pennsylvania reached the conclusion that we would either have to suffer under this odious liquor dealers' license, or else join hands with the whisky dealers, with the view of abolishing the tax on liquors altogether. We cannot expect to accomplish such an end as having this tax abolished so far as the retail dealers are concerned. As long as we sell whisky in any manner, shape, or form, we will be obliged to pay a retail dealer's license. There can be no exception made in the case of the druggist. Now, Mr. Chairman, I oppose this motion because I believe it to be entirely futile.

Mr. Colcord.—I do not know whether a motion would be in order at present, unless it be by unanimous consent, but I certainly would like to make one to give a better opportunity for debate during the rest of the session, and that is to limit the speeches to three minutes, and that no one should speak twice without unanimous consent being given by the house.

Mr. Remington.—I hope we will have a free discussion on this subject, and that many members will express their views.

Mr. Schafer.—I beg pardon for rising the second time, but as the seconder of the original motion, I ask the privilege of saying that in a discussion of this kind as far back as 1874, I was the unfortunate mover of a resolution looking to the accomplishment of the purpose as stated, only that the discussion was on the stamp act, and the majority opinion was against me. The resolutions did not pass, and succeeding that we commenced to discuss the subject in state associations. The National Wholesale Drug Association came in support of it, and we have accomplished the repeal of the stamp act.

The question now before this Association has recently been before the Wholesale Association at Boston in charge of a committee, in very much the same sense. The question was not only as to the repeal of the $25 liquor license, but likewise of the tax on spirits and alcohol when used in the manufacture of medicine. Now then, if you conclude that both of these laws be amended or repealed, I say so far as it applies to medicines, we have an argument which no honorable legislature can gainsay, and that argument is that liquor when used as medicine is merely medicine, just like any drug or chemical in our pharmacy. We are not alone in this matter, but we have the hearty co-operation of the members of the National Wholesale Drug Association in every state, and the majority of them have expressed an affirmative view on this question. When they all co-operate to that end Congress will then be very glad to regulate the matter and see that the remedy is applied. The exception applies to the actual necessities of medicine as the resolution is amended. It is not in the spirit of Congress, nor in the public sentiment of the country to place a tax on medicine which the poor must use. A tax should be placed on liquors used as a beverage, but not on a medicine; and this is no less a medicine because it is alcohol or a spirituous liquor.

MR. WHELPLEY.—Mr. Barnum, of Louisville, told us how he managed to do business without selling liquor in any form. It sounded very pleasant, and undoubtedly a great many would like to experience the pleasure of carrying on the drug business in the same way, but it is impossible, for you will have customers demanding liquor for medicinal purposes, and if you do not keep it they will give you much trouble, will refuse to buy drugs of you, and go to another store or town, no matter how far off, where they can be supplied with what they want.

MR. BROWN.—In regard to the sale of liquors by druggists in the country, I am free to confess that the necessity of it is very much overestimated. I do not believe that the 391 drug stores in Kansas keep liquor in any form, nor do they have a United States license or permit from the State to sell it, nor do they sell it. The law is enforced, and if a druggist desires to sell liquor he must get a petition in the ward in which he lives signed by 25 freeholders and 25 families, testifying to his good character and to his sobriety, to his temperate sentiments, and if the material facts in this petition are found to be false, the signer of the petition is held responsible, and liable to a fine of $50. He must go before the probate judge of the county, where a statement of the case is made and testimony is taken from all parties who may see proper to protest against it. If there is no protesting against it he must present himself before the State Board of Pharmacy and get a certificate of registration. He must give bond in $1000 that he will comply with the law. He must, in addition to that, appear before the notary public, and then the privilege is conferred upon him. Every person who wants liquor for any purpose must give a strict account of his use of it. An individual going to a drug store must sign an application for liquor, stating what it is to be used for, and that it is not to be used as a beverage. The oath of the party is taken, and should it appear afterwards that the purchaser of the liquor obtained it for immoral purposes, he is liable to arrest and to a fine of $100.

MR. EBERT.—I would like to say that I once lived in Kansas, and got away from the State because the law was too stringent. [Laughter.] However, I will say with Mr. Brown's permission, it's all very nice to regulate this question of the sale of liquor in little towns of from 200 to 1000 people, but it cannot be successfully done in large cities like New York, Philadelphia, Boston, Cincinnati, or any city of a cosmopolitan character where it's impossible for people to agree on this question of temperance. Mr. Brown is aware that I would not remain a resident of Kansas, and it was mainly due to this oppressive law, which would not allow me as an American citizen the free choice of eating and drinking. However, in reference to the question of being relieved of this liquor tax imposed upon the retail druggists of this country, I would offer the following as being likely a happy medium in getting relieved of the odium of being classed as retail liquor dealers, at the same time not be deprived of the sale of spirits for legitimate purposes. Throughout Europe, where tobacco is a source of revenue to the governments, dealers in manufactured tobacco are appointed for the sale of the same, and thus become agents of the government, and as such are required to keep always on hand a supply of postage stamps, or, in other words, become authorized agents for supplying the public with postal matters—so that wherever you see the sign of a tobacconist, a supply of postage stamps, etc., can always be had. How is it with us? Does not nearly every druggist in the large cities at the present time perform this same work for the public gratuitously? Why should we not be relieved of this annual tax, made agents for the government, and be required to keep and supply the public with the commodity, although such a trifle, yet when necessary the very important little postage stamp? It is true, we stumble upon a difficulty in making the ready arrangement—the retailer's liquor tax belongs to one department and the postage stamp to another department of our system of government; yet I believe that this difficulty can be overcome if we will go to our legislators and say to thom that we wish to be relieved from this classification of retail liquor dealers, and are willing to give to the public in return our services in supplying them with postal matters. It seems to me if we succeeded we would be gainers in such a bargain.

Mr. Colcord.—While Mr. Brown was speaking, the thought occurred to me to ask what was the state of the bitters business in his part of the country. I was in Kansas for about a year in a small town, and was astounded at the extraordinary demand for bitters—Hostetter's. That was fifteen years ago. I know that it is a Prohibition state, and the question arose in my mind whether these tonic bitters and similar preparations took the place of alcoholic liquors. The amendment made by Mr. Schafer reads "for medicinal purposes only." I think the wording would be better "for pharmaceutical uses." The mere passing of resolutions by the state, local or national Associations will be of no avail. Whenever the druggists of the United States are ready to say, We want this law repealed, and we stand ready to accomplish it, then it can be done. Our Association is not able to do it alone; the National Wholesale Drug Association cannot do it alone; it will take a large amount of money, since much correspondence will be required, and committees will have to be sent to Congress and their expenses must be paid. This is independent of the work of the state associations. At the last meeting of the committee on trade interests in Massachusetts it was agreed to raise subscriptions to help remove this tax, with the understanding that the money was not to be called for until the whole sum was ready to be used, that nothing should be paid for salaries, but only for legitimate work, and whatever money was left should be returned to the donors. This is what our Association voted to do, and they ask the co-operation of other state associations. I think there is no doubt but what in a few years we can accomplish our purpose.

Mr. Hallberg.—As the Secretary has referred to the position of the State Associations on this question, I deem it only proper to state that we have discussed it in the Illinois Pharmaceutical Association, and the delegation was instructed to report to the American Pharmaceutical Association, that while the Illinois State Association favored the repeal of the $25 internal tax on druggists, we were opposed to the abolition of the internal revenue tax on alcohol. Both these points are included in this one resolution; they ought to be separate. I cannot see why anybody should object to have the $25 revenue tax removed, as it classes druggists with the liquor dealers. On the other hand, I see the greatest objection to the removal of the tax on alcohol; in fact, so great that it would almost be an injury to the drug business. There is scarcely a pharmaceutical preparation whose cost is not influenced directly or indirectly by the cost of alcohol. Now, if the tax on alcohol was removed, the decrease in the cost of all pharmaceutical preparations would reduce the volume of business at least 40 per cent. In the retail drug business it was never a question of profit; it has always been a question of the amount of business done. If we do a business of $20 nowadays, at a profit of $8 or $6, by the abolition of the internal tax we curtail the business say to $12 or $15. Our profits would then become correspondingly reduced, and our losses would be greater, because rent and other expenses would be just the same. In fact, the loss is so apparent that I cannot conceive how any retail druggist can favor the abolition of the tax on alcohol. However, it has one redeeming feature; it would virtually wipe out the fluid extract manufacturers, because it would enable every retail druggist to make his own fluid extracts. The cost of alcohol would come down to almost nothing, and he could well afford to lose a pint of alcohol with every pint of fluid extract that he prepares. Now the majority of druggists do not make their fluid extracts, because it is too much trouble to recover alcohol by distillation. I am in favor of low values, but not unless low values pertain to everything throughout the country. I am not in favor of free trade, because I want everything on as equal a footing as possible. Therefore, I say I would never favor the repeal of the internal tax on alcohol.

THE CHAIRMAN.—The Chair will state on this question that the State of Wisconsin stands practically in the same position with Illinois; we are waiting the action of this Association upon this question of the $25 internal tax. Legislation has taken that stigma from the druggists in our State; they are no longer classed as retail liquor dealers. Our State requires a license of $300 from every man dealing in liquors, except the druggist.

MR. ALEXANDER.—It is the United States we are speaking of, that classes us as retail liquor dealers.

THE CHAIRMAN.—The point is this, that where the tax is inflicted by the State, we can take hold of that at home, and after we have done that we are ready to take hold of the $25 license tax.

MR. ELIEL.—Now I have had some experience in connection with this liquor license. A few years ago, when I was chairman of the National Retail Druggists' Association, the authorities at Washington stated that as long as the internal revenue demanded it, they would demand the license, and they propose to keep up that liquor tax as long as they can collect it. I do not know that there is any particular benefit in agitating its removal. Then I opposed it. I take the same stand to day. What benefit was the removal of the stamp tax to the retail druggist or to the druggists generally? I claim, none. It has been of benefit only to the manufacturers of proprietary articles. Now, if we do not want to sell liquor we do not need to pay this tax. As soon as we sell liquor we must pay the tax. I do not see any use in this agitation.

MR. BRYANT.—In reference to Kansas, Mr. Brown has given you a correct history of the manner in which liquor is dealt out in our State. The great majority of the druggists in our State do not sell it. In our cities we are hardly ever bothered by applicants for liquor.

MR. COLCORD.—I rise to ask the gentleman a question. Do the druggists not take out a retail liquor dealer's license?

MR. BRYANT.—No, sir.

MR. COLCORD.—I had occasion to request the ruling of the Internal Revenue Department on the question of selling alcohol, and the ruling was that pure alcohol could not be sold in any quantity without taking out a regular retail liquor dealer's license. The question in my mind is, do these gentlemen carry on the drug business without being required to sell alcohol? A great many do not know that that is the law.

MR. BRYANT.—Many druggists in our State do not take out the United States license, and do not sell alcohol. If they sold alcohol they would be compelled to take out a United States license and also a permit. It is difficult to get a permit from the probate judge to sell intoxicating liquors in our county. Consequently many druggists in our city have taken out no permits at all. Under the old regime, prior to 1st day of May 1887, the way of obtaining liquor from the druggists was to make an application and send it to the probate judge under oath. Under the old law the city druggist made from fifty to seventy-five or one hundred sales a month. Since the 1st day of May I have not had applications for liquors in my store to exceed three or four in any one month. In case liquor is necessary, you have to go to the druggist having the permit, make application, and be sworn to the facts set forth in the application, and then you must take it from the premises before you can administer it.

MR. EBERT.—Does that apply to the sale of bitters?

MR. BRYANT.—No sir, it don't. We do not use bitters at home, but cordials and things of that kind. The man that sells them has a permit to sell them, and if he violates it he is liable to a penalty of imprisonment and $100 fine.

MR. HALLBERG.—Who decides whether they are intoxicating?

MR. BRYANT.—It has been decided by the courts.

MR. ELIEL.—How do you account for the fact that they use so much bitters in Kansas?

MR. BRYANT.—I do not know how to account for it, unless it comes from St. John. The gentleman said that the removal of the tax would decrease the amount of business. I cannot see that that would be the effect; I would sell paregoric at 10 cents an ounce the same as before.

MR. SHEPPARD.—The gentleman has given us rather radical opinions from his city on that question. It may be interesting to the gentlemen here to hear from another State in which there is not the same sentiment prevailing, except that the druggists are very much troubled by having been classed as retail liquor dealers on account of that $25 tax. We have druggists in Boston who have never taken out a United States license or paid a liquor tax in any way or shape. Of course they do not sell alcohol, but sell brandy or any intoxicating liquor only on prescription when it is part of a compound. The Inspector of Internal Revenue has made a rule that under these conditions it is not required to take out a United States license.

MR. CANNING.—I purposely, as I said before, embraced both subjects in one resolution, for the reason that I think both echo the sentiment of the retail trade throughout the country. I think the argument presented by Mr. Hallberg is a very strong one against the tax on alcohol. Its removal would do away with the fluid extract manufacturers, and would allow the druggist to make his own fluid extracts.

MR. HALLBERG.—I do not regard that as being such a great disadvantage on the other side.

Mr. Stevens.—I have never taken out the United States license until a month ago, and I have never kept what is called intoxicating liquor in my place; but in the city of Pittsburgh the Law and Order Society returned a number of pharmacists for selling soda water on Sunday, and others for selling intoxicating liquors. I was returned for keeping open on the Sabbath, but I sell neither cigars nor liquors, and of course I was acquitted. But I was brought before the Internal Revenue officer of the district for selling preparations containing alcohol, to which charge I pleaded guilty. For that we are compelled to pay the United States tax of $25, and that is the ruling of the powers that be at Washington.

Mr. Ebert moved to divide the question on the resolution; Messrs. Eliel and Day seconded Mr. Ebert's motion, and Mr. Canning spoke in favor of it and accepted it.

Mr. Thompson.—The gentlemen are anxious to have this portion of the motion carried relating to the $25 tax. If you would put it in a different shape from what you have it in now, I believe its condition would be improved. You ask how to have the liquor dealers' tax as applicable to the sale of liquor as a medicine revoked. I think if you would simply ask that the law requiring a special license be repealed it might be enough. There are but two special licenses required, one for the sale of liquor and one for the sale of tobacco. These special taxes annually yield six million dollars to the government, but aside from the dealers' tax, both tobacco and spirits pay a large revenue to the government. It is really unfair that the government should tax its citizens for dealing in an article which it has already taxed the producer to make. I believe if you will modify the resolution as suggested you will not only have the druggists to work for it, but every man who sells tobacco or liquor of any kind, and you may get the whole law repealed.

Mr. Wells.—The law is ambiguous, and should be amended. Congress will never repeal the $25 liquor dealers' tax. Therefore the only proper way would be to have it amended so as to permit the druggist to sell alcohol for medicinal purposes and the arts. The various internal revenue officers in the different States have put different constructions upon the law, but the Internal Revenue Commissioner has invariably decided against the druggist selling liquor in a prescription, or alcohol. In different States revenue officers who have been politicians have decided indifferently, in order to get the favor of the druggists. This is radically wrong. In some States the druggists pay a license, and in other States they do not. A committee of the Ohio State Pharmaceutical Association recommended that the law be amended so as to allow the sale of spirits for medicine and the arts. That is always necessary. I think you will only succeed in doing that. Of late it has been the custom in every State and National Association to pass resolutions in regard to this matter. This is all unnecessary work. You must get up a petition to the Congressman and Senator representing you in order to produce an impression. But they will pay no attention to resolutions. You must also give your reasons in an intelligent manner why you want the law repealed or modified. This is just the way that was pursued for the repeal of the stamp tax, and if you would proceed in this manner the law may be amended. But Congress will not grant to the druggists privileges for the sale of liquor that are not allowed to other interests. Get up a general petition in each district, have it largely signed, and presented to your Congressman; he will then know what the druggists want, and use his influence.

Mr. Good.—Mr. Thompson in his opening speech voiced my sentiments so completely that it seemed to me unnecessary to say anything. By going before Congress with a petition we would be asking for privileges as a class, and Congress never will give them: we are not entitled to them. The rum-selling druggist is abroad in the land; he is likely to stay there for some time; and the United States government will not open the door to fraud which would result by creating a privileged class excluded from paying this tax.

MR. CANNING.—If we succeed in getting this tax removed the rum-selling element will still persist; but the United States is certainly strong enough to put it down.

MR. THOMPSON.—If an amendment is in order at this stage of the proceedings, I move to amend the resolution by putting in the following words after the words to cooperate with the State Associations and the National Wholesale Drug Association: "to ask Congress for a repeal of the law so far as it relates to the special license now paid by druggists when liquor is sold as a medicine or in any other way." We want the whole law wiped out. You will get nothing by asking Congress to allow druggists to sell liquor without paying the license. We have an equitable right to say to Congress that this liquor, this brandy, rum, gin and tobacco has already paid to the Government a fair proportion of tax, and a larger proportion than any other staple industry of the country, and now you have no right to impose an additional tax upon a man for dealing in this article. You have to pay not only the State and city tax, but in addition the United States tax. When the Government has more revenue than it knows what to do with, they can well afford to dispense with this. If we go earnestly before Congress with petitions asking them to wipe out this tax, it may be done. Of course it will take a great deal of labor, but no doubt the liquor dealers will help you on with it. How can Congress enact a law which will say everybody who sells liquor shall take out a $25 dealer's tax unless he sells it for medicine? Why would not every saloon-keeper be ready to swear that he sold it for medicinal purposes? After the liquor was sold you could use it for medicinal purposes or use it in any way you pleased.

Mr. Canning declined to accept Mr. Thompson's amendment.

The previous question was called for, when, the Chair proceeding to take the question on the first part of the resolution as amended by Mr. Schafer, Messrs. Sayre, DeForest and Alexander stated that the question should first be taken on Mr. Thompson's amendment. The motion was formulated to read:

Resolved, That the Committee on Commercial Interests be instructed to confer with the N. W. D. A. and the various State Associations in reference to memorializing Congress *to repeal all special license taxes.*

This was adopted by a vote of 37 to 22.

The question on the original motion as amended being presented, Mr. Canning moved that it be indefinitely postponed. Several members stated that the previous question having been ordered before, must first be disposed of. The Chair ruled that the previous question had been disposed of. The motion to indefinitely postpone was then lost, and the original resolution as amended was adopted.

Mr. Hallberg read the following from the Illinois State Pharmaceutical Association:

Resolved, That the American Pharmaceutical Association request manufacturers and dealers to label their products in conformity with the official nomenclature, and to designate strengths by the specific gravity or percentage strength, abolishing arbitrary signs and obsolete standards, such as "F" marks and Beaumé.

On motion of Mr. DeForest, the resolution was referred to the Committee on Commercial Interests for consideration next year.

On motion of Mr. Remington the Section adjourned.

J. W. COLCORD,
Secretary Section on Commercial Interests.

MINUTES OF MEETINGS

OF

SECTION ON SCIENTIFIC PAPERS.

WEDNESDAY, SEPTEMBER 7TH, 3 P. M.

The meeting was called to order by Mr. Alexander, temporary chairman.

Nominations were called for for permanent chairman of the Section.

Mr. Diehl nominated J. P. Remington.

Mr. DeForest nominated E. Painter.

Mr. Ebert nominated T. Roberts Baker.

The name of Prof. Remington was withdrawn.

Messrs. Ebert and Sloan were appointed tellers, and reported that 25 votes were cast, of which Mr. Baker had 15.

On motion of Prof. Remington, the election was made unanimous.

Nominations for Secretary of the Section being in order, Mr. Barnum nominated Mr. Carraway, of Tennessee.

C. S. Hallberg nominated A. B. Lyons.

Messrs. Good and Barnum were appointed tellers, and announced that of the 31 votes cast, Dr. Lyons had received 19.

On motion of Mr. Carraway, the election of Dr. Lyons was made unanimous.

The newly appointed officers having taken their places, on motion of Prof. Remington, the chairman nominated as members of the Committee on Scientific Papers, the secretary of the Section and J. M. Good, and on motion the secretary of the Section was instructed to cast the ballot of the Section for the nominees. The Committee consists accordingly of T. Roberts Baker, *ex officio* chairman, A. B. Lyons, J. M. Good.

On motion of Mr. Painter, the reading of papers was made the next order of business.

Mr. Painter announced that the Committee had fourteen papers to present. Copies of most of these papers had been printed, and would be distributed to the members in attendance to aid them in following the readers of the papers, and holding the subjects before them for discussion. This action had been taken on the recommendation of the Committee on Papers and Queries.

Clay W. Holmes, of Elmira, N. Y., was called upon for the first paper: Reply to Query No. 2.

VANILLIN.

Reply to Query No. 2.—Prepare extracts of vanilla from vanillin, and compare them to similar preparations from the natural drug. By Clay W. Holmes, Elmira, N. Y.

A reply to this query seemed at first glance to be quite easy and practical; the effort to make a thorough and satisfactory examination from which facts might be stated as absolute, has proven quite another thing. If this article shall go beyond the scope of the question as intended by the Committee, a desire to ascertain the actual value of vanillin may, perhaps, be a sufficient excuse.

Of samples, two manufactures only could be obtained, which are designated as "Paris," made by Haarmann & Reimer, the original inventors, and "American," claimed to be made and largely advertised by an American extract manufacturer. As it is claimed by both manufacturers that one ounce of vanillin will do the work of from 40 to 50 ounces of the best vanilla bean, it seemed advisable to prepare samples of various strength. I have therefore made solutions representing from 8 to 48 ounces of bean, as shown in the following table of samples, all of which are based upon the relative working formula of one ounce of vanilla bean to one pound of menstruum, this being the average strength of the extract ordinarily sold:

1. Vanillin, Paris, representing 48 ounces vanilla bean.
2. " " " 24 " "
3. " " " 16 " "
4. " " " 8 " "
5. " American " 48 " "
6. " " " 24 " "
7. " " " 16 " "
8. " " No. 2, " 16 " "

Duplicates of each of the above marked "A" are colored with caramel.

9. Mexican vanilla, 1 oz.

10. Coumarin, crude, 1 oz., representing 16 ozs. of tonca bean.

As the American manufacturer in all of his advertisements insists that the solution of vanillin must be colored with burned sugar "before tasting or using the extract," I have divided all samples and colored one portion of each. I obtained a sample of crude coumarin, from which a solution representing 1 ounce to 16 of tonca bean was prepared. An extract was also made from the best Mexican vanilla. The samples are before you for examination. Finding the sense of smell very unreliable in my own efforts with so many samples, I will leave you to determine for yourselves the sensible qualities as thus shown, and delineate the results of actual test so far as I have been able to prove them.

With the aid of a competent judge, I examined Samples Nos. 2, 3, 5, 6, 7, 5A and 7A at a soda fountain in the following manner: To half an ounce of simple syrup, in eight clean soda glasses, five drops of each sample was added, and about one ounce of carbonated water injected from the small draught tube. These mixtures tasted and compared carefully gave the following sensible results:

Nos. 1 and 5 did not have any apparent vanilla taste or odor.

Nos. 2 and 6 gave a vanilla taste, not very decided. A faint odor was perceptible.

Nos. 3 and 7 gave a decided vanilla flavor, pleasant, but lacking the fullness of true vanilla. The odor was quite marked.

Nos. 5A and 7A did not differ from the uncolored samples, except in the odor, which was very marked.

As between the two samples, the Paris vanillin seemed to give the most satisfactory results.

From the results of the tests as given, the writer is forced to acknowledge that vanillin will produce an artificial extract which resembles vanilla, but not of the strength indicated by the manufacturers. When it is used in the ratio of one ounce to one pound of good vanilla bean, no one could readily recognize the substitution, and the relative values would be equal. Commercially there is quite a variance. The Paris vanillin costs about $5.50 per ounce, the American $12.00, and a good eight-inch extract bean from $10.00 to $11.00 per pound at present market rates.

Desiring to know what resemblance the microscope might show between vanilla and vanillin, but being unable, from pressure of official State work, to enter into this line of investigation, I solicited the aid of my friend Dr. R. G. Eccles, of Brooklyn, to whom I am indebted for the facts given. Specimens of all samples used in making the solutions were submitted, also some true vanilla crystals and synthetic coumarin. To better illustrate the resemblance existing, the doctor drew some off-hand sketches, without any attempt at mathematical accuracy, but sufficiently characteristic to convey to the mind a proper conception of the appearance when magnified. The illustration given will aid the description, and is a photographic reproduction of the pen sketches. The samples herewith submitted are those from which the specimens were taken. Sketches Nos. 1 to 4 represent the natural condition. Nos. 5 to 8 were first dissolved in alcohol and then allowed to evaporate and crystallize spontaneously on a slide. The result of this examination shows some resemblance between the true vanilla crystals and the vanillin. I had suspected the presence of crude coumarin as an admixture in at least one sample (American No. 2), but No. 8 disproves this unless the coumarin was amorphous in the process of recrystallization.

1. Crude Coumarin.
2. True Vanilla Crystals.
3. Paris Vanillin.
4. American Vanillin, No. 2.
5. True Vanilla, crystallized on slide, from alcoholic solution.
6. Crude Coumarin, crystallized in same manner.
7. Synthetic Coumarin, crystallized in same manner.
8. American Vanilla, No. 2, crystallized in same manner.

You will note, on examining the samples, that the American vanillin No. 1 resembles very closely the Paris, the only difference cognizant to the naked eye being a yellowish tinge in the American, while the Paris is white. American No. 2 has an entirely different appearance. This is much darker, and looks like a mechanical admixture of Paris vanillin and crude coumarin. Both American samples are from the same manufacturer, No. 1 being sent out to a druggist on regular order, and No. 2 obtained as a sample direct from the manufacturer.

Both manufacturers claim that vanillin is the aromatic crystalline principle of the vanilla bean, existing in the amount of 2 per cent. The American manufacturer asserts that for the last past year he has been buying large quantities of vanilla beans in Mexico, and separating the crystal from the bean, "thus avoiding the heavy custom-house duty and other expenses." This probably accounts for the difference in price. The Paris vanillin costs $5.50 per ounce; the American (avoiding the duty?) $12 per ounce. Perhaps he is not aware that vanillas have been for a long time free from duty. The assertion would convey the inference that he bought green beans, or if cured ones, only the cheaper grades. The fact is that green beans possess no crystals (vanillic acid), and are as devoid of flavor as a lima bean. The process of curing develops the peculiar flavor which is principally, but not entirely, dependent upon the vanillic acid generated, and unless the "vanillero" be skillful, the beans will be rank, and the cured bean worthless. It is also true that the vanillic acid or crystals do not form to any appreciable extent, except upon the finer grades of vanillas, which indicates that it is not present even to the extent of 2 per cent. except in fine-grade beans. It is also true that a certain amount of the natural oil of the vanilla adheres to the crystals, which cannot be separated. This is shown by putting the crystals on paper. Oil will be observed to be distinctly visible. Neither sample of vanillin exhibits anything of an oily appearance. True vanilla crystals are slowly soluble in alcohol, owing to the oil present. Vanillin is dissolved almost instantly. These facts being true, does the reasonable reader suppose that any man can take three pounds of good vanilla beans and extract one ounce of vanillin at either of the prices named, or at any price? Or is there any intelligent pharmacist who for a moment supposes that either manufacturer makes vanillin from vanilla bean? Is it practical to believe that an extract or chemical principle can be extracted from any substance and be sold for one-third the cost of the material used? So far as the writer believes, or can learn, vanillin is made from either pine-cones or eugenol, the active principle of cloves, and therefore is a substitute for vanilla. If offered to the trade as a substitute, and sold to the consumer as a solution of vanillin without color, the writer has nothing further to say. Let those buy who wish. If offered by any one as the active principle of, and obtained from the vanilla bean, I think, in the State of New York at least, the dealer so offering would be violating the food law, and be liable to penalty. While vanillin is a clever substitute for the true bean, no reputable pharmacist should for a moment attempt to offer a preparation of it for vanilla.

MR. HOLMES.—I will further state that I also examined, so far as I was able, commercial vanilla. I bought an ice cream feezer and had the work done under my own eye. Taking one teaspoonful of the extract representing one ounce of vanillin to sixteen ounces of the bean for one quart of cream, freezing thoroughly and effectually and submitting the ice cream to those who knew enough to make the test, the opinion was expressed that it was good vanilla ice cream. I then took a teaspoonful from the bottle representing 1 part to 50, and made ice cream, but it did not taste of vanilla; there was just sufficient flavor to it to indicate that it had been flavored with something, but with what, was a question. On applying heat to the compound, it liquefied, became oily, gave off a very powerful empyreumatic odor, and almost instantly turned black and had the appearance of burned sugar. The product did not seem to be brittle, and there was very little of it left. I had a small quantity to work with, and wanted to ascertain whether it would completely volatilize, but it would not. That is as far as I carried the experiment.

MR. MENNINGER.—Of course you used the mixture of vanilla and tonka? I believe most manufacturers use that. I am told that French confectioners flavor their confections with an extract made by putting the vanilla bean into hot syrup, which is afterward strained.

MR. HOLMES.—I believe that vanillin is used to a much greater extent than is suspected by many reputable parties, as a substitute absolutely; and if it is thus used, the preparation should not be offered as extract of vanilla.

MR. THOMPSON.—Has Mr. Holmes, in his experiments, arrived at any conclusion as to the relative value of the vanillin?

MR. HOLMES.—It would take about one ounce of vanillin for one pound of vanilla.

Mr. Remington.—Is the flavor of vanillin equal to that of the vanilla bean? Is there any taste in the bean separate from that of vanillin? It has a peculiar, somewhat empyreumatic taste and flavor, which is absent in the vanillin.

Mr. Holmes.—My paper will answer that question. Numbers three and seven gave a vanilla flavor.

Mr. Remington.—My question follows from the one Mr. Holmes answered to Mr. Thompson. If one ounce of vanillin is equal to one pound of vanilla bean, in what respect is it equal?

Mr. Stevens.—As a result of my experience during the past year, I would say that vanillin does very well as a substitute for tonka. If you want to add it to the genuine vanilla bean, you would have to be exceedingly careful as to the amount, otherwise you would get the taste and a pinous odor, which as far as my experience has gone is retained in all commercial vanillins that I have seen.

Mr. Holmes.—I think, Mr. Remington, I can answer your question in this way. I presume you agree with me that not one person out of fifty knows the true vanilla flavor from the false, but will say that the false is the true flavor. People throughout the country will take tonka and call it good vanilla.

Mr. Remington.—I will go further than that. I think the majority of people throughout the country will take the true vanilla and say it is not vanilla, and will take the tonka extract and say it is true vanilla.

Mr. Holmes.—All those who accept tonka as good vanilla will also say that vanillin, in the proper proportions, is true vanilla, that is to say it resembles it very closely. There is something unpleasant about tonka and vanillin to a person who knows what vanilla is.

Mr. Lloyd.—Can you give the rule by which to determine vanilla bean?

Mr. Holmes.—The only rule I have is the use of the nose. It is not anything that can be described.

Mr. Stevens.—It is something to be acquired.

Mr. Holmes.—After the fire in my store I began the manufacture of vanilla extract. I had made it in my retail store for a long time, absolutely pure, without any addition whatever except sugar. I offered such on the market, and was selling it to dealers throughout the country, but was obliged to take some of it back. To this I added just one-half tonka, and the result was it met a ready sale, and I quit making it. I believe that extract of vanilla should be made of vanilla, and should not be composed of tonka and vanilla.

Mr. Hallberg.—Some time ago, in conversation with one of the largest manufacturers of extracts in the country, he stated that the process of maceration was going on in large tanks at a temperature of about 75° to 80° F., and was continued from six months to a year, according to the time of the year. This would indicate that the flavor of extract of vanilla is very much improved by age. I think it is quite reasonable, because the active principle being acid, possibly in contact with alcohol and heat is gradually transformed into an ether, and that ethers have considerable influence upon the flavor of the vanilla. This, perhaps, is a point that it would be well to remember in making extracts.

Mr. Holmes.—In the course of my investigation, a statement came to me that one manufacturer had admitted to another gentleman that it was an every day matter to make vanilla out of benzoic acid. I asked Dr. Eccles to give me microscopic illustrations of benzoic acid, but there was not time enough for this meeting, so I was obliged to omit that part.

Mr. Whelpley.—In regard to these microscopic illustrations, I would like to ask Mr. Holmes if they were made from solutions at different temperatures, to ascertain if they crystallized in the same manner. Temperature, concentration, and other conditions influence crystallization. Some one else may make an examination and find different crystals under the microscope, and be misled.

Mr. Holmes.—One operation was performed, simply to show the appearance of the different crystals.

Mr. Whelpley.—Figure 5 is stated to be "true vanilla, crystallized on slide, from alcoholic solution," but the concentration of the solution and the temperature are not given. The microscopic appearance of crystals may be misleading unless obtained under precisely similar conditions.

Mr. Holmes.—Necessarily the solution was evaporated to dryness, but the temperature was not noted.

The second paper called for was by G. W. Kennedy, in reply to Query No. 11. "What is the best and most permanent menstruum for fluid extract of licorice root?"

ON FLUID EXTRACT LICORICE ROOT.

BY GEORGE W. KENNEDY.

In order to arrive at a satisfactory conclusion in framing a formula for a fluid extract of this drug, it is absolutely necessary to take into consideration the principal constituents of the root, and their best solvents; when in possession of this knowledge, there should be no trouble experienced in preparing a fluid extract containing the essential principles of the drug, and one which should remain unchanged, holding permanently the desirable constituents in solution. There is nothing more unsightly in the shop of a pharmacist than a bottle containing some galenical preparation, of which probably one-eighth is a precipitate, deposited most likely owing to the unskillful and unscientific manner in which the preparation was made. Not only is the appearance objectionable, but who knows but this precipitated matter may contain the very substance which should be held in solution, and which should be given in divided doses when dispensed in the prescriptions of physicians, and not all in a few doses, which would probably be the case if this deposit was dispensed from the last few ounces in the bottle.

I find in taking a retrospective view of the pharmaceutical literature of this old and useful drug, licorice, that considerable has been written in regard to its properties and the best means of preparing various preparations of it. In the efforts to render medicines palatable in these days of pharmaceutical elegance, this root is very largely used for masking the taste of bitter drugs, such as quinine and other nauseous remedies. Although a very ancient drug, it seems to have been entirely overlooked for a long time. The peculiar property referred to is due to the sweet principle, glycyrrhizin, acting on the gustatory nerves, deadening their sensibility.

Robiquet (in 1809) obtained from licorice root, starch, asparagin, albumen, a resinous oily matter, to which the slight acrid taste of the root is due, and glycyrrhizin, a peculiar sweet principle, which can be obtained by precipitation from a strong decoction upon addition of an acid or a solution of bi-tartrate of potassium. The same investigator also found it to contain malic acid. The starch in the root can very readily be seen by the aid of a microscope, or by testing a decoction with iodine, when the characteristic blue color is produced.

In 1875 Roussin found the sweet principle to be present in the root in combination with ammonia as glycyrrhizate of ammonium, which he obtained pure from the cold infusion by precipitating with sulphuric acid, washing the precipitate with water, dissolving it in strong alcohol and adding ether, when a blackish mass is thrown down; the clear liquid is then carefully mixed with small quantities of alcoholic solution of ammonia. The precipitate is yellowish, very light, and by evaporating its aqueous solution is obtained in brittle, translucent, shining scales.

The "Pharmacographia" says when glycyrrhizin is prepared from a decoction of the root, by precipitation with a solution of cream of tartar or basic acetate of lead, then washed with diluted alcohol and dried, it is an amorphous yellow powder, possessing a strong, bitter-sweet taste, and an acid reaction. It forms with hot water a solution which gelatinizes on cooling, does not reduce alkaline tartrate of copper, is not fermentable, and does not rotate the plane of polarization.

In 1861 Gorup-Besanez found glycyrrhizin prepared in a similar manner to that of Roussin to have the composition $C_{24}H_{36}O_9$, to be soluble in hot water, alcohol, and ether, and on boiling with dilute acids to be split into glucose and a bitter resinous substance named glycyrretin, which is insoluble in water, but dissolves in alcohol and alkalies. By fusing it with potassa, Weselski and Benedikt (1876) obtained paraoxybenzoic acid, $C_7H_6O_3$.

The above embraces the principal literature bearing upon the pharmacy of the drug. It will be noticed that the alkalies readily dissolve glycyrrhizin the principal substance to be obtained in making the galenical preparations of the root. Pharmacists therefore should not lose sight of this important point, and formulate a good working menstruum accordingly.

I have found after several trials of mixtures of alcohol and water, and of alcohol, glycerin and water in various proportions, the results obtained in the completed extracts were not altogether satisfactory. A 12 per cent. alcoholic menstruum will not preserve the finished product. I have noticed fermentation to set in after standing 2 or 3 months during the summer, which caused precipitation; the precipitate, upon examination was found to be principally glycyrrhizin, but by the addition of ammonia to the menstruum very good results were obtained, certainly a decided improvement over the old formula of the pharmacopœia of 1870, which does not contain any alkali. The preparation contains a much larger amount of the sweet principle; besides no precipitation of the finished product was observed to any extent six months after being manufactured. The sweetness of the extract being so much stronger, the slightly acrid taste of the root is scarcely perceptible, thus making it more desirable as a flavoring ingredient in cough remedies, and concealing the taste of bitter medicines, for which purpose it is frequently prescribed by physicians. The formula for the fluid extract of the pharmacopœia of 1880 is very good, with the exception that too much ammonia water is used: there is one and a half ounces in each pint and in all my experience and observations, I have found one ounce sufficient, at least very excellent and satisfactory results were obtained, and this was only determined after repeated experiments were made with a view of finding out the smallest amount of ammonia it was necessary to use. I also recommend the addition of glycerin to the menstruum, as the finished product is much handsomer and continues to remain so. By the improved formula which the writer herewith furnishes, if the material operated upon is good and the process carefully managed in every particular, a perfectly reliable and stable fluid extract can be made.

Extractum Glycyrrhizæ Fluidum. (Fluid Extract Licorice Root.)

Take of

Licorice root, in moderately fine powder	16 troy ounces.
Glycerin	3 fluidounces.
Alcohol,	
Water,	
Water of ammonia, sp gr. .960, of each a sufficient quantity.	

Mix 5 ounces of alcohol, 3 fluidounces of glycerin, 7 ounces of water, and 1 fluidounce of water of ammonia. Moisten the powdered drug with the menstruum, pack in a cylindrical percolator, cover the surface, and pour on the remaining portion of the menstruum; when percolation commences, close the orifice with a cork, then cover the percolator, to prevent evaporation, and set it in a moderately warm place for two days, after which the cork is removed and diluted alcohol poured upon the top and percolation continued. The first 12 fluidounces obtained are reserved, and percolation goes on until 12 fluidounces more passes, which liquid is carefully evaporated to 4 fluidounces, when the two portions are mixed. After standing two or three days filter through paper.

MR. KLIE.—My experience with this article is such that I think the ammonia should be about one-half the quantity ordered by the Pharmacopœia. I make the fluid extract by repercolation. Sometimes it has a rank odor, but on placing aside it loses that odor, probably because the glycyrryhizin becomes saturated with the ammonia; while the ammonia predominates the fluid extract has a very bad odor, for that reason I used to think that the formula would be greatly improved by taking about one-third of the present quantity, which would be sufficient for all purposes.

MR. DIEHL.—It seems to me that Mr. Kennedy advocates about two thirds of the quantity that the Pharmacopœia prescribes, and the previous speaker finds that one-third of the quantity is sufficient. Now, sir, when the formula for fluid extract of licorice root was constructed the process of repercolation was not contemplated as an officinal process. If the pharmacopœial formula is followed, only a certain portion of the ammonia used is in the original percolate that is to be reserved. The quantity of ammonia that is added in the beginning, in my experience at least, is completely absorbed, and gives a soluble glycyrrhizate. Afterwards, as the percolation proceeds more ammonia is added to the menstruum, not because it is absolutely necessary, but because some of the glycyrrhizin may have escaped combination with the ammonia; it is thus obtained in solution, which is finally evaporated so that the excess of ammonia is driven off. So when the process of the Pharmacopœia is followed, notwithstanding the excess of ammonia apparently used in the operation, the final product does not contain an excess.

MR. EBERT.—I would like to say in connection with this that I think the formula itself would be much improved if there was no heat used whatever. I have found in making extracts of licorice according to the Pharmacopœia, that if a portion of it is evaporated a certain amount of turbidity results, making it very difficult to filter. It is presumed that arises from resinous matter. I am quite positive it is not the case, but it is due to the starch granules which are in the solution, and are converted into starch paste. A more reasonable formula would be, providing you wanted an alcoholic solution of it, to take a larger quantity of the drug itself and percolate it, and form a saturated solution. I have had considerable experience in the manufacture of solutions of licorice root for the purpose of supplying the manufacturers of tobacco with the active principle of licorice in solution, and I have found that water with lime water percolated through ground licorice would form a solution which they would use in their manufacture to great advantage. The ammonia process has been pretty well tried by the manufacturers of tobacco, and they have had a great deal of trouble; it gives a very unpleasant taste to their tobacco. I am satisfied that the sediment Mr. Kennedy speaks of is due to a great extent to starch granules, and when heat is applied a gelatinous precipitate is formed.

MR. REMINGTON.—I want to ask Mr. Kennedy to what condition the reserved portion was reduced before the process was finished.

MR. KENNEDY.—To a syrupy consistence.

MR. REMINGTON.—Mr. Lyons, Mr. Lloyd, and other gentlemen present, have considerable experience with the manufacture of fluid extracts, and these gentlemen will bear me out in the statement that there is a very important principle connected with the making of these preparations. The last edition of the Pharmacopœia follows the plan of evaporating the last portion to a soft extract. Why? Because by mixing alcoholic solutions of different densities, having different alcoholic strengths, sooner or later precipitation of some of the constituents of the finished fluid extract will take place, and this cannot be avoided. If you begin, for instance, with a menstruum of three parts of alcohol and one part of water, set aside the percolate to be reserved, and then evaporate the last percolate to a syrupy consistence, the alcohol has gone off, and you have practically an aqueous solution left. On adding this aqueous solution to the alcoholic reserve you will obtain a precipitation, because you have altered the menstruum. Therefore the process of the Pharmacopœia of 1870 is not nearly so good as the pharmacopœial process of 1880, which requires the weak percolate to be evaporated down to an extract, so that almost all the water and alcohol are driven off. That I think will largely explain the subject of precipitation.

Mr. Diehl.—I would like to add one word so as not to be misunderstood in reference to the remarks made on ammonia. I have no doubt but that the quantity of ammonia might be reduced in the formula, and if the statements of Mr. Kennedy are based upon experiments and experience, which I presume they are, then it is all right to reduce it. Ammonia being added only in order to insure the presence of all the glycyrrhizin in the extract, the use of ammonia in the subsequent percolate I do not think amounts to anything, because any excess is evaporated afterwards.

Mr. Lloyd.—My experience has been that the amount of ammonia varies with the licorice root; if the licorice root is very fresh, a very much smaller amount of ammonia is required than if the root is old, I suppose owing to decomposition of the glycyrrhizate. I would like to ask a question of Mr. Kennedy as to the effect of the licorice in disguising the taste of bitter substances, quinine especially—whether it is altogether correct that this is owing to the fact that it blunts the nerves of taste? Although I am not sure that investigations have been made in that direction, I know that, for example, I can distinguish the taste of either substance. The sensation of taste is very distinct. In many instances the masking of the bitter taste is caused by precipitation of the alkaloid by this ammonia compound.

Mr. Finlay.—What is the condition of the fluid extract made by that process? Is it alkaline or acid?

Mr. Painter.—Somewhat alkaline. It is supposed to be free from ammonia in excess.

Mr. Klie.—The finished product made according to the present Pharmacopœia is not clear; that is, avoid boiling and do not evaporate, but make it by re-percolation, and take nothing but the clear percolate. After putting this aside, there appears a sediment that will occupy in a pint bottle about six ounces. From a half gallon bottle I can pour off a quart of very clear fluid extract, but the balance is turbid.

Mr. Hallberg.—I think that the amount of water of ammonia depends very much upon the kind of licorice you have, and I have no doubt but that the precipitate is chiefly starch. If we could hit upon some simple pharmaceutical plan by which we could precipitate the starch from the percolate or extract, and then finish to the same standard of strength, we would have a much better pharmaceutical preparation. Of course, starch is obtained to a greater proportion if an aqueous menstruum is used in displacing the original alcoholic menstruum; the more water is used, the more starch will be precipitated. I would like to ask Mr. Klie, also Mr. Kennedy, whether the ammonia used is ten per cent., or whether your opinion is based upon the ammonia water as bought, which is usually eighteen per cent.

Mr. Klie.—I have been using ammonia water of pharmacopœial strength, and of this less is required than is ordered by the Pharmacopœia.

Mr. Menninger.—Will you allow me to say a word? I would like to ask some of the gentlemen from the Southern States whether they have any experience in making preparations from the so-called American licorice. The Chairman of the Section no doubt knows that the country people in Virginia and North and South Carolina bring it to the drug stores in bundles. It is the same species, no doubt. They used to bring it to my store when I was in business in the South. I asked the question because it may be of interest in making experiments with the fresh root in the southern sections of this country. It looks somewhat like Russian licorice root.

The Chairman.—I have seen the indigenous sarsaparilla brought in, but know nothing about indigenous licorice root.

Mr. Maisch.—It is entirely new to me to learn that there is an American licorice root. I know that many years ago at New Lebanon glycyrrhiza glabra was cultivated locally. The same species is cultivated to a very limited extent in New Jersey; I do not know to what extent. Mr. Procter had it on his place at Mount Holly, and it bears our winters very well.

Mr. Menninger.—I know of what I speak. I had a drug store in Raleigh, and the negroes used to bring the roots. They said they gathered it in the fields. It is identical with the other. I never saw the plant.

Mr. Lyons.—Wild licorice in the Northern States is entirely different. The small roots contain the sweet principle of glycyrrhiza, and have been used as a substitute in the United States for true licorice.

Mr. Maisch.—I now remember there is a species of glycyrrhiza (lepidota) growing in the Southern States.

Mr. Carraway.—This subject has been spoken of by a writer on botany; he says it is only found in the back sections of Virginia, North Carolina and South Carolina. I think he has very nearly a whole chapter on that subject. I have seen a great deal of it growing myself.

Mr. Remington.—In order that more information shall be obtained on this subject, I move that it be referred to the Committee on Papers.

J. M. Good read a paper, answering query No. xiv., "What is the best method of clarifying solution of gutta-percha, U. S. P."

LIQUOR GUTTA-PERCHÆ: SOLUTION OF GUTTA-PERCHA: TRAUMATICIN.

BY J. M. GOOD.

The officinal process for this preparation, as is well known by all who have tried it, is entirely unsatisfactory, and hence the demand of the query for a better one.

The limited use which it has had is to a great extent responsible for the perpetuation of the process, through a number of decades, which has given such an indifferent result. Yet in apposition to this it may be stated that an inferior article would necessarily find little favor.

A good article, used as a simple external coating, possesses merits not fully appreciated, but more recently it has come to be frequently prescribed as an excipient for chrysarobin, salicylic acid, and other substances used in the treatment of skin diseases.

The sample which I here present, and which is clear even to brilliancy, was prepared by myself by a process which is neither new nor startling. It is to take of

Gutta-percha, select and cut into shreds	4 parts.
Chloroform	96 "

Put the chloroform into a wide-mouthed bottle, add the gutta-percha, and agitate frequently until dissolved. Then filter.

The first criticism on the officinal formula is, that the amount of gutta-percha ordered is too great, the solution is so thick that the carbonate of lead is deposited slowly and with difficulty. If eventually a product is obtained which has some degree of transparency, it is too thick for satisfactory use. To clarify the liquid so that it may be rendered transparent is the next desideratum. This step is simplified somewhat by the first modification of the formula.

Filtration has heretofore been considered impracticable, and for even a quite dilute solution we must still regard the ordinary filter but poorly adapted; but fortunately Thomas Stewart, of Philadelphia, with his "patent textile filtering paper," comes to our relief and furnishes us with a filter which answers every requirement of the case. The apparatus for filtering must be closed, and adapted for volatile liquids. That known as the "Mohr & Redwood" device, and described in the different works on pharmacy, is simple and convenient.

A quick and easy way to prepare this solution is to dissolve the dentists' white purified gutta-percha in chloroform, but the objection to this is the cost of the purified article, it being quoted at about $1.00 an ounce, while a good article of gutta-percha may be purchased for $2.00 a pound. A good article of traumaticin may be purchased for $2.75 per pound.

The actual cost of it, prepared as I have shown you, is less than seventy-five cents a pound. A sample in my possession, purchased from a reliable firm, left upon evaporation four per cent. of pure gutta-percha.

This is apparently the same strength as what I have prepared. It is in reality about one-half per cent. stronger. The filter which I used was counterpoised, and on weighing the dried deposit on the filter, the gutta-percha, although the best that could be obtained in the form of chips, was found to contain 10 per cent. of impurities. If five per cent. instead of four be employed, the solution could still be readily filtered, I think. Decimal proportions, where they can appropriately be employed, are the most acceptable, but the actual strength of the officinal solution can be left for future experiment.

Mr. Remington.—In what respect is this textile filtering paper superior to French filtering paper?

Mr. Good.—For rapid filtration.

Mr. Painter.—It works very well indeed. Ordinary gutta-percha dissolves readily by a slight elevation of the temperature in benzol. Let the solution stand for 24 hours, when the insoluble portion of the solution will settle to the bottom of the vessel, leaving above a solution as clear as crystal, which can be drawn off and the benzol recovered, if desired; or it may be evaporated, and you obtain a residue perfectly soluble in chloroform, and making a perfectly clear solution. Benzol is pretty expensive. You can dilute it with benzin to some extent. The benzol solution separates quickly and thoroughly, but I do not believe bi-sulphide of carbon solution would separate so readily.

Mr. Remington.—Bi sulphide of carbon has a high specific gravity. Benzol is very much lighter, about 88.

Mr. Hallberg.—Benzol can be obtained at any place for about 90 cents a pound.

Mr. Painter.—We do not buy it for 90 cents a pound, but we pay one dollar and a half a gallon. You can have it landed anywhere in the United States for about $2 per gallon.

Mr. Whelpley.—Purified benzol?

Mr. Painter.—It answers the purposes if it is not purified.

Mr. Remington.—I have had difficulty to obtain pure benzol, and have had to substitute benzin. Some time ago it was almost impossible to obtain benzol in Philadelphia. At one time a manufacturing company there went into the business of making coal tar products—derivatives from coal tar to be used as solvents—but the enterprise did not prove successful. I sent to several of the best houses in New York to get the benzol for certain experiments, and when I did get it, it was not of that purity which I had been accustomed to use. Therefore I know from personal experience that it is difficult to get reliable benzol. There is a vast difference in the price. If you want absolutely pure benzol it is very expensive. You can get the cheap benzol, which is used for some purposes as a solvent, as Professor Painter has said, for about a dollar and a half a gallon; but I do not think that such benzol should be used for accurate work, because it is a mixture, containing toluol, xylol, and other impurities. The price depends upon the labor bestowed upon fractional distillation; and it is difficult to separate these products which are so closely allied. For absolute benzol you have to pay a high price.

Mr. Painter.—I do not see why you should require absolute benzol for this purpose.

Mr. Whelpley.—I have used benzol in my microscopical work, and found it almost impossible to get it. The wholesale houses would send benzin, and I saw a letter from one house in Chicago saying that there was no such thing as benzol, but that it was benzin he wanted. But I know that some wholesale houses in Chicago and in St. Louis keep benzol on hand, and I had to pay $1.50 a pound for it. It came in pound bottles. The market price for pure benzol at this time is 85 or 90 cents.

Mr. Hallberg.—Mr. Whelpley is certainly right. Benzol can now be obtained in Chicago, but could not be obtained until quite recently. I have used it in large quantities. We could not get it until we went to a firm who had the contract of taking the by-products of the gas works in nearly all the western cities, and from them you can obtain the crude article benzol for twenty cents a gallon, which answers as a solvent very nicely.

Mr. Lloyd.—In this part of the country there is a demand for benzol. For use under the microscope ordinary benzol is unsurpassed. I had considerable difficulty in getting it until Dr. Charles Rice suggested the name of a house in New York City that prepared benzol at an ordinary price, and it was found to answer every purpose. It can be sold at from seventy-five cents to one dollar a pound, and very much less than that if obtained in three-gallon packages.

Mr. Barnum.—I had occasion to use three or four barrels of benzol, and I experienced some difficulty in obtaining it, but the Warren Commercial Company in New York, who are doing a large amount of roofing, make chemically pure benzol which can be obtained for two dollars by the barrel—a nearly pure article at a dollar and a half will answer for all practical purposes. I believe parties are supplying pure benzol for about fifty cents a pound. The query asks for a better formula for the officinal solution of gutta-percha. Mr. Painter has presented the discussion on benzol, and has led us entirely off the original question. If we desire to have a clear chloroform solution of gutta-percha it seems hardly necessary to purify the gutta-percha by dissolving it in some other liquid and re-dissolving it in chloroform.

Mr. Whelpley.—I hope we will not lose sight of pure benzol at two dollars a gallon, and that Professor Painter will inform us definitely where it can be obtained, as it will be valuable information for the microscopists.

A paper by C. O. Curtman was next read on Query No. 28, "Agents for making hydro-alcoholic and aqueous solutions of volatile oils, etc."

AGENTS FOR MAKING HYDRO-ALCOHOLIC OR AQUEOUS SOLUTIONS OF VOLATILE OILS, ETC.

BY DR. CHAS. O. CURTMAN.

For the purpose of obtaining officinal solutions in water of a variety of essential oils, camphor, etc., various processes have been devised, so as to secure not only a full saturation, but at the same time a perfectly clear and limpid product. In case of the aromatic waters, distillation gives certainly a very good result, superior in many instances to the solution of previously distilled oils, but it is on the one hand somewhat troublesome and expensive, while on the other it does not always avoid turbidity, arising from too great an abundance of the aromatic oil. To obtain in a short time and at trifling expense an aromatic water, of full strength and thoroughly clear, it was formerly the practice to mix the oil with magnesia (so as to divide it into very small particles, and thereby render it more readily soluble), and after addition of the water to filter it. The product thus prepared is certainly quite clear and well saturated, but objectionable from the presence of magnesia in solution, which renders the aromatic water less suitable as a solvent for silver nitrate, etc. In the last Pharmacopœia cotton is directed as absorbent and distributor of the substances to be dissolved, and it yields excellent results so far as clearness and saturation are concerned; but complaints have been made that slimy flakes of fungoid growths are more likely to occur in waters prepared by this method. To obviate such a deterioration Dr. Hoffmann has proposed the use of finely powdered talcum, while others have used precipitated calcium phosphate, and others again the silicious material, composed principally of fossil diatoms, and known under the name of "kieselguhr" or "diatom earth" (erroneously called "infusorial earth"). At the request of Mr. J. M. Good, of this city, who kindly supplied me with specimens of materials from various sources, I made a series of experiments as to their relative value, not only for the preparation of medicated waters, but also for the clarification of various fruit juices and elixirs, in which vegetable acids, ammonium citrate, etc., are among the ingredients.

It soon became evident that calcium phosphate is not very suitable for the latter purpose, as quite a quantity is dissolved by the vegetable acids. Even aqua cinnamomi prepared with its aid, while of beautiful clear appearance, left, on evaporation and ignition upon platinum foil, a considerable permanent residue.

Different specimens of talcum procured from various sources, after washing with dilute hydrochloric acid, according to Dr. Hoffmann's directions, were unexceptionable for the preparation of aromatic waters. When treated, however, with tartaric or citric acids, or ammonium citrate, iron passed into solution. To remove this more completely than by simple washing, 100 parts of talcum were boiled for a short time with a mixture of 100 parts of dilute hydrochloric acid, U. S. P., and 400 parts of distilled water. The turbid mixture was allowed to settle, the liquid decanted, and the residue again boiled for a few minutes with a like quantity of dilute hydrochloric acid, of about one-half the strength of the foregoing. After standing and decanting the acid, water was added to the residue, and thoroughly shaken up with it, and the decantation repeated several times, until a specimen of the water poured off did not longer give the prussian blue reaction for iron with potassium ferrocyanide. The moist talcum was then thrown upon a filter and washed out with distilled water until the removal of all the hydrochloric acid was indicated by a failure of the filtrate to produce a cloudiness with silver nitrate.

Talcum thus prepared forms a most efficient and unexceptionable material, not only for the preparation of aromatic waters, but also for the clarification of various acid materials entering into the composition of elixirs, etc. Not the least trace of permanent residue can be found after filtration through it in solutions of vegetable acids or ammonium citrate.

The next experiments were made with silicious earth from two sources, the "kieselguhr," from Germany, and "diatom earth," from Virginia. Both of these contained large quantities of iron, the Virginia specimen more than double that of the German. They were purified in the same manner as the talcum, but required much longer boiling before being freed from iron. After purification they were used for the preparation of aromatic waters. They yielded excellent results, so far as clarification is concerned, but did not appear to absorb quite so much oil, so that the same quantity of oil requires about 10 per cent. more of kieselguhr than of talcum; while the Virginia specimen proved even somewhat less absorbent than the German. Treated with organic acids and ammonium citrate they yielded nothing to them.

On comparing the different materials experimented with, it is evident that thoroughly purified talcum stands at the head of the list. Next comes German kieselguhr, which fully equals talcum in its excellent results, but requires to be employed in somewhat larger quantity. Nearly equal to this stands the Richmond diatomaceous material, while calcium phosphate is not eligible. In the short time allowed for observation, no slimy flakes of fungoid growth were developed in any of the specimens.

St. Louis, Mo., August 1, 1887.

MR. GOOD.—Among the subjects assigned to me by Dr. Rice was this one. I did not make the experiments, but I knew that Professor Curtman's well known ability would carry more weight than mine, and that he would examine the subject thoroughly. His results are embodied in this paper. I had previously recommended talcum to Mr. Rice for preparing aromatic waters, and Doctor Curtman's conclusions confirm mine. I know that some of the members maintain that calcium phosphate is good for the purpose.

MR. REMINGTON.—Do you consider talcum equal to the phosphate as an absorbent?

MR. GOOD.—I do not think it is equal to the carbonate of magnesium as an absorbent.

MR. REMINGTON.—My opinion is, it is not one fourth as good. It is a cheap material.

MR. THOMPSON.—What comparative test may be used for the waters?

MR. GOOD.—There is none but the physical test.

MR. THOMPSON.—Do you consider it reliable for comparing the results of different processes?

MR. GOOD.—I consider it sufficiently so for aromatic waters.

MR. THOMPSON.—I think it is very difficult to determine whether an aromatic water is stronger in odor than another made by a different process. The test of smell is a very uncertain standard to go by. In experiments made some time ago we used as a test for comparison the amount of oil dissolved in the water and the amount of salt to be added to it before it would become turbid.

MR. STEVENS.—The essential oils are soluble to a certain extent in water, and we use water as a solvent. The use of cotton, talcum and magnesia and other substances for this purpose has been discussed since the Pharmacopœia was published. I do not think that there is any difficulty at all in using cotton, but the Pharmacopœia directions are perhaps rather crude. They advise that we take a certain quantity of the essential oil, drop it on absorbent cotton, distribute it by picking the cotton apart, then pack this and percolate. My process has been to separate the cotton into four or six parts, as the case may be, after it has been saturated with the essential oil, then I pack a layer of about one inch of pure silica, the purest sand I can get, in the percolator, then one of these sections of cotton, then a layer of sand, then a section of cotton, and so on until the percolator is filled. Then I commence percolation, and if perchance the first percolate passes through cloudy, I return it to the percolator, and thus obtain a perfectly clear medicated water without deposit. I am an advocate for this cotton process; talcum or any of the other substances is not equal to the silica, or pure white sand.

Mr. Lemberger.—Is Professor Stevens familiar with the glass wool?

Mr. Stevens.—It would be a good deal better, but it is expensive. Take any pure quartz sand, and you can get it almost anywhere.

Mr. Painter.—If you use talcum you can get a saturated solution, and that is all that you can get by any process; but for an absorbent powder the infusorial earth mentioned probably will serve the purpose as well as absorbent cotton. The manufacturers of dynamite, giant powder, and other explosives require a very highly absorbent material to absorb the nitro-glycerin. Magnesia has been used, but is expensive. They use infusorial earth because it absorbs a large quantity of nitro-glycerin, and it is one of the best materials, barring magnesia, for making giant powder.

Mr. Stevens.—The absorbent property has been spoken of in the paper; but what do you want to absorb?

Mr. Painter.—The object of the absorbent is to distribute the oil over a greater surface so that the water passing over it passes over a greater surface.

Mr. Stevens.—Oil of peppermint is soluble in water to a certain degree, and no more can be dissolved with the aid of the absorbent property of cotton.

Mr. Klie.—Making medicated waters with cotton, I have always had more or less trouble with them; for in two or three days a growth would develop. I think if cotton is to be retained, some provision should be made to put it into a shape that it will not produce such growth. I would suggest that the cotton to be used for making medicated waters be heated to a certain temperature before using; after that process it might answer better.

Mr. Good.—I would like to call attention to the fact, that we want a suitable agent not only for preparing aromatic waters, but also for clarifying elixirs. The cotton process is all right, but will not answer for clarifying elixirs. I would like to see some arguments and conclusions controverted if they are wrong; one is that the phosphate is not adapted, because more or less of it is dissolved in the acid employed, and Mr. Painter says it is not so absorbent.

Mr. Painter.—Talcum answered admirably for the purpose in the preparation of elixirs.

Mr. Lloyd.—Perhaps I am foreign to the subject, but I wish to state that the new process is satisfactory to me, and that it is necessary to let the water pass slowly through the cotton, remaining in contact with it a certain length of time before it passes through the percolator. I think that this is absolutely necessary in order to get good results.

Mr. Remington.—The objection to the cotton process is, that it is not very cleanly. You are sometimes compelled to use your fingers for pulling apart the cotton saturated with oil. I admit that it is probably a purer method if you look at it through analytical spectacles, for preparations of this kind. Instead of the arrangement which Mr. Stevens recommends, all the practical advantages may be had in a much simpler way. Pack into the funnel, before you begin with the saturated cotton, a plug of absorbent cotton; this serves to distribute the little particles which might drop through mechanically, and you get a clear water. Now in regard to the charge that because these waters are passed through cotton, there is more tendency to a microscopic growth, I think that it will be found on investigation not to be so, because these confervæ occur in aqueous solutions of all kinds; and we should not adopt that view until it has been proved by actual experiment. Similar growths will form in waters made by any process. I will not accept the assertion that one process is better than another, in that respect, until it is proved. Now with regard to the use of talcum, I have tried it to a large extent for elixirs as well as for medicated waters, and have given it up. I made a series of comparative experiments, and the objection to the magnesium carbonate and calcium phosphate is a theoretical one principally. Medicated waters are sometimes used as solvents for alkaloids, and these alkaloids would be precipitated; but this is not a valid objection for entailing on all the pharmacists of this country the contemplated process, while the contingency is so removed that this very rarely happens. Besides that, I want to be absolutely certain by actual experiment that talcum or any other substance produces the effect and yields better solutions. The new process brings a new principle forward in order to displace an old process, and we should be very careful to prove that the new one is better than the old before we adopt it.

MR. HALLBERG.—This subject is not complete until we have touched upon another method—the method by hot water.

MR. REMINGTON.—That's the best of all.

MR. HALLBERG.—It is my pet method. It seems to me that the real object has been lost sight of. We want an agent or method by which as complete a division of the oil as possible may be effected. We next want an agent which will yield a clear filtrate. Now why necessarily combine two in one? The hot water method gives us that division better than we can possibly obtain it by any mechanical agent. It comes nearer to nature and to the original intention when medicated waters were made by distillation, than any of those mechanical or chemical agents which have been advocated. Now, if this is the best method for this purpose, why can we not resort to the old reliable method of simple filtration through filter paper to get a clear product afterwards?

MR. STEVENS.—My previous remarks have been on aqueous solutions of essential oils. We all know that oil of peppermint is more soluble in water at an increased temperature, but its excess is again separated at the ordinary temperature, therefore hot water is unnecessary. We want to dissolve the oil of peppermint in the water at the ordinary temperature, and therefore we divide it. Talcum is soluble, therefore objectionable, and it is known in chemistry that there is nothing but what is to a certain extent soluble in the general solvent, water.

MR. PAINTER.—Glass?

MR. STEVENS.—Yes, sir; even glass. What is the lesson to be learned from this? We suggest that cotton is the best material, but the process is laborious. Our solvent, water, is percolated through the cotton at the ordinary temperature. We can dissolve more oil in hot water, but what will be the result when it comes down to the ordinary temperature?

MR. HALLBERG.—It will be a saturated solution, and that is all you can get with cotton or by any other method.

MR. STEVENS.—That is what we want; but with hot water we get more than a saturated solution.

MR. HALLBERG.—Yes; and you can filter the water after it's cooled down.

MR. STEVENS.—Providing we have a proper filter paper.

MR. HALLBERG.—The method was described about fourteen years ago in the "American Journal of Pharmacy" for 1874.

MR. HOGAN.—Some years ago I made many experiments on medicated waters, and found in every instance that the Pharmacopœia directed a large excess of oil; about eight drops was the average quantity a pint of water would take up. By dropping this on pieces of filtering paper, adding boiling water, putting a plug of cotton in the neck of the bottle, and agitating for some time, I obtained a superior water, which answered every purpose. Using distilled water and good oil of neroli, I could produce orange flower water much superior to that in the market. I think the hot water process is the best.

MR. STEVENS.—In the preparation of medicated waters I have used distilled water for a number of years, and have had no trouble with the growth that has been spoken about.

MR. KLIE.—The fungoid growth referred to by me was observed when using the distilled water.

MR. REMINGTON.—It is mostly found in distilled waters.

MR. KLIE.—I do not make any medicated waters by the cotton process at all, but by the old-time process of distilling. With some waters you will have trouble unless you get the green plant. For instance, in making peppermint-water I have no trouble if I use the green plant.

MR. REMINGTON.—I perfectly agree with the remarks that have been made, that of all processes for medicated waters from the volatile oils, the hot water process is the best and the simplest. It is possible that Mr. Stevens has not been made familiar with the method, and I think if he had tried it carefully he would have come to the same view. Most of the volatile oils are of course more soluble in hot water than in cold, and from the saturated solution the excess is easily filtered out. Before Mr. Hallberg brought up this subject, we were discussing the characters of the various powders used for making waters and elixirs. Of course, the hot-water process is not applicable to other preparations than medicated waters.

On motion of Mr. Whelpley, seconded by Mr. Bedford, the subject of medicated waters was referred to the Committee on Scientific Papers, with the view of obtaining positive evidence as to the asserted detrimental character of such waters prepared with the aid of magnesium carbonate and other substances.

The following papers by Mr. Gallagher were read:

NORTH CAROLINA STILL FOR DISTILLATION OF OIL OF SASSAFRAS, OIL OF PENNYROYAL, OIL OF PEPPERMINT, ETC.

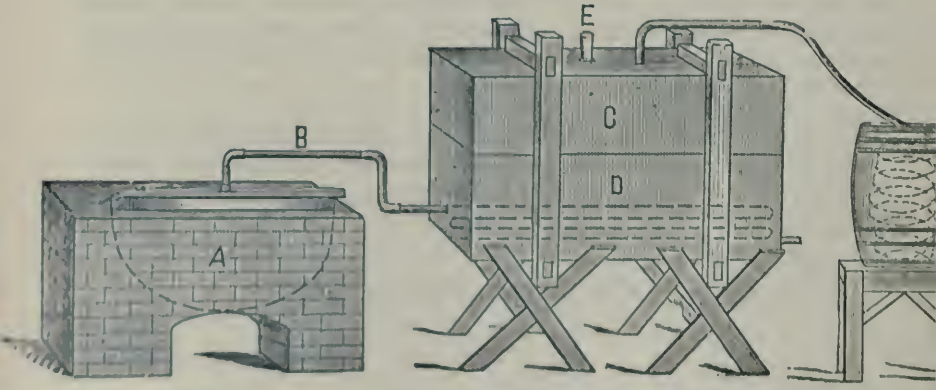
(*Nets a profit of $3 a day.*)

BY CHARLES K. GALLAGHER, WASHINGTON, N. C.

A trench is dug in the ground, ending in a chimney. A box with sheet-iron bottom, closed top, and auger-hole to introduce water in the top, is surrounded by a barrel, which is connected (by an elbow of wood, bored out with an auger) to a tin pipe lying in a trough of cold water, which is the condenser. The outfit costs about $10. The sassafras roots are dug, washed, bruised, and chopped into short pieces, and placed in the barrel. Water is introduced into the steamer or box, all the joints luted tight with clay, and fire applied in the trench. The steam passes through auger holes in top of box and bottom of barrel, and is condensed and passes into the receiver with a portion of oil, which is decanted from above or the water drawn off below.

APPARATUS SUCCESSFULLY USED FOR MAKING ALCOHOL FOR HOSPITAL USE DURING THE CIVIL WAR BETWEEN THE STATES.

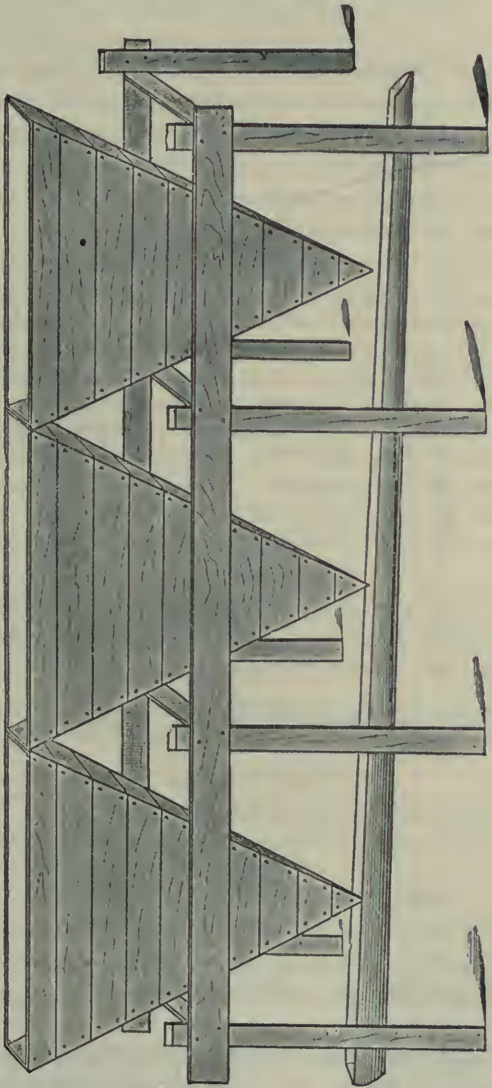
BY CHARLES K. GALLAGHER.



A, ordinary farm boiler or kettle, with iron lid securely bolted on; B, steam-pipe ending in a coil within trough; C, D, two troughs made of gum logs, one inverted over the other, securely luted tight and fastened together by clamps and wedges. The beer to be distilled was introduced at E, and the opening closed with a plug. The distillate—"low wines"—was collected at F and redistilled from a set of similar troughs not shown in above figure, and heated by a continuation of the steam coil from D.

CONFEDERATE APPARATUS FOR MANUFACTURING SALTPETRE FOR AMMUNITION.

BY CHARLES K. GALLAGHER, WASHINGTON, N. C.



Any convenient number of percolators, made of rough boards, arranged over a trough after the style of the old-fashioned "lye stand," similar to above figure. Into these was placed the earth scraped from around old tobacco barns, from under kitchens and smoke-houses. Then water, or water and urine, was poured upon it until thoroughly leached or exhausted. The percolate was collected in a receptacle and evaporated, the salt re-dissolved, filtered, again evaporated, and crystallized from the mother water.

The Section then adjourned until Thursday morning.

THURSDAY MORNING, SEPTEMBER 8TH.

The Section was called to order by the Chairman at 9:40 o'clock.

Mr. Painter exhibited an interesting specimen of some of the sand which was brought to the surface of the earth during the great earthquake last August in South Carolina, and read the following from a letter from Mr. G. J. Luhn, of Charleston, S. C:

> The earthquake of the 31st of August, 1886, was attended with remarkable phenomena of the ground opening in fissures and throwing up sand in geysers, varying in color to the extent of about 100 different colors, almost every geyser throwing up a different color of sand. It is supposed that some of it came from the depth of 2000 feet below the surface of the earth. This has not been calculated, but estimated. This sand has been collected and distributed to almost every scientific body in the United States as a curiosity, and samples may be found in almost every museum in the United States. It was this sand which I had collected and arranged in about fifty different colors, and packed in a large tube to be exhibited as a matter of curiosity at the meeting of the American Pharmaceutical Association in Cincinnati. I beg of you to take charge of it, and if you think it worth while, exhibit it at the meeting and afterwards dispose of it at your discretion.

J. U. Lloyd read a synopsis of a valuable paper on oil of pennyroyal, by Ed. Kremers, of Wisconsin. A. B. Lyons read a synopsis of a companion paper to this, on oil of citronella.

ANALYSIS OF THE VOLATILE OIL OF HEDEOMA PULEGIOIDES, *PERSOON.*

BY EDWARD KREMERS, PH. G.,

Assistant in the School of Pharmacy of the University of Wisconsin.

A contribution to the meeting of the American Pharmaceutical Association, held in Cincinnati, September, 1887.

DERIVATION OF NAME AND SYNONYMS.

The study of the name and synonyms of this plant is connected so closely and in such an interesting way with that of the names and synonyms of the allied European plants, that it is impossible, under this heading, to treat of the American plant alone.

The genus name, *Hedeoma*, is derived from the Greek word 'Ηδυόσμον, an ancient name of Mint. The word ἡδυόσμον is derived from the two Greek words, ἡδύς, sweet, and ὀσμή, smell.

The species name, *pulegioides*, is derived from two words. The first word is the Latin *puleium* or *pulegium*, the genus name of the Russian *Pulegium micranthum*, and the species name of *Mentha Pulegium*, L., which is found in most parts of Europe, and in several countries of Asia and Africa. The second word is the Greek εἶδος, form, from the resemblance in form of our American species to the European species.

The word "Pulegium," in its turn, is derived from *Puleium regium*, an old Latin name of the European plant, given to it from its supposed efficacy to destroy fleas, the Latin of which is *pulex, icis*.

The name *Pennyroyal* can probably be traced from the following synonyms of the European plant, which I summarize here for the above-mentioned reason:

Pulegium.—Plinius xix., 47.
Pulegium sylvestre.—Plinius xx., 52.
Puleium regium.—Old Latin name, Flück. and Hanb.
Mentha pulegium, L.
Pulegium vulgare, Miller.
Menthe puliot.—Pharmacopée Française, 1884.
Puliot vulgaire. " " "
Puliot commun. " " "
Pennyroyal.
Puloil royal.—Old herbals, Flück. and Hanb.
Organry.—In Wales, "Gardeners' Chronicle, vol. vii., p. 408.
Poleia.—Hildegard, A. D. 1160.
Poley.—Konrad von Megenberg's Buch der Natur, Augsburg, 1475.
    Hortus Sanitatis, 1492.
    Brunfels, Herbarium eicones, 1530.
    Bock, Kräuterbuch, 1530.
    Fuchs, New Kräuterbuch, 1542.
Boley.—Hortus Sanitatis, 1492.
    Brunschwyg, Kunst d. Destillirung, Straub, 1500.
Polich.—Nemnich, Polyglotten Lexicon d. Naturgeschichte, 1793.
Flöhkraut.—Schlesien.
Fröschpoley.— }
Fröschpolich.— } Henneberg.
Herzpolei.—Maaler, 1561.
Püll.—Siebenbürgen.

(These German synonyms have been taken from "Pritzel and Jessen," Deutsche Volksnamen der Pflanzen.)

Only a few of these many names, more or less modified, have been extended to our American plant.

Pennyroyal, Puliot Américain, Amerikanischer Polei. Besides these, the following synonyms are used, to my knowledge, in connection with the American plant only:

Melissa pulegioides.—Linné.
Cunila " Willdenow.
Ziziphora " Desfontaines.
Mock Pennyroyal.
American " } In distinction from High Pennyroyal, the Mentha
Low " } Canadensis, L.—Johnson.
Squawmint. } American Homœopathic Pharmacopœia, ii., 1883.
Tickweed. }

The name "False Pennyroyal" does not pertain to any plant of the genus Hedeoma, but is a synonym for Isanthus cœruleus, Michx.

HISTORY.

From the list of synonyms it is readily seen that the European plant must have quite a history. It is mentioned in the writings of Dioscorides, Pliny, Cicero, and many others. It was esteemed greatly for its odor. Not only did Pliny recommend it to be hung in sleeping rooms in preference to roses, as more conducive to health, but he uses the name "pulegium" figuratively in his "Epistolæ ad Familiares:" "ad cujus rutam pulegio mihi tui sermonis utendum," *i. e.*, the pleasantness of your discourse.

Numerous other quotations might be made, but this would lead beyond the purpose of the present paper. Those interested will find a brief but interesting account in the "Pharmacographia." The American plant has but little history, but even this is not easily interpreted. It is possible that the authors of the American Homœopathic Pharmacopœia, who use the synonyms squawmint and tickweed, might trace their derivation, and bring out some historical points of interest.

It is at present officinal in the U. S. P., 1880, and in the American Homœopathic Pharmacopœia of 1883, whereas the Mentha Pulegium is officinal in the French, Spanish, Greek, Belgian, and even Mexican Pharmacopœias.

ORIGIN.

Hedeoma pulegioides is a low, odorous annual, indigenous to North America from Canada through the United States. It grows in barren and sandy fields, on hills and along the open border of woods. In the sandy fields of New Jersey, for instance, it grows, according to Professor Maisch, in many places so extensively that it can be collected by the ton without much trouble. Messrs. Tarrant & Co. inform me that it grows both wild and cultivated in North and South Carolina, New York, New Jersey and Pennsylvania. As for the Southern States, Dr. Carl Mohr wrote to me that to his knowledge no pennyroyal is cultivated in the Gulf region for the distillation of the essential oil. In Alabama, western Florida, Mississippi and Louisiana it extends scarcely beyond the 32° N. latitude, and it is certain that it does not occur in the western region up to the 31° N. latitude. From the central part of these States, however, it is found in abundance in sandy places, particularly in calcareous soils.

It has also been found in Wisconsin, specimens having been furnished the University Herbarium from Racine and Hustisford.

DESCRIPTION.

As I am not able to add anything new concerning the description of this plant, I merely refer to Gray's Manual, Wood's Botany, the National Dispensatory, Luerssen's Medicinisch-Pharmaceutische Botanik, and other standard works. In the last two works, descriptions of its European congener may also be found.

CONSTITUENTS AND MEDICINAL ACTION AND USE.

The virtues of this plant depend upon the volatile oil it contains, which is to be treated of more fully below.

For its medicinal action and use, I refer to the National Dispensatory, and other works of materia medica and medicine.

Aside from its slight medicinal use, and its external application as a protection from the bites of mosquitœs, the oil has mainly served as an adulterant of peppermint oil. Its consumption for this purpose has been quite considerable, but is now greatly diminished.

PREPARATION OF THE VOLATILE OIL.

In the "Popular Science News," Vol. xx., p. 161, an article by Thos. C. Harris, of Raleigh, N. C., on the manufacture of the oils of sassafras and pennyroyal was published, which to the present date, May 27, 1887, has not, to my knowledge, been noticed by our American pharmaceutical journals, although a reprint has appeared in the London "Pharmaceutical Journal and Transactions," 1887, p. 672. This paper, which is illustrated by a wood-cut, is so interesting that, for the sake of completeness, it may be abstracted here:

In some of the interior counties of North Carolina may be seen in operation many primitive establishments for the manufacture of the oil of pennyroyal. The apparatus used in this work is so exceedingly rude and primitive as to appear ridiculous to most observers; but the product is of good quality, and constitutes a profitable industry.

The usual style of a "still," as shown may be briefly described as a short trench in the ground, ending in a low flue or chimney. Over this trench is placed a closed wooden box, having a sheet-iron bottom and an auger-hole on top, through which water is poured. An ordinary barrel stands endwise on top of the steam-box, allowing steam to pass freely up through the barrel. A lute of clay is used to close the joint between the lower end of the barrel and the steam box, as well as the cover of the barrel. Instead of a "worm," a tin pipe immersed in a trough of cold water is used, and a steam connection with the barrel is generally made by an elbow branch of wood bored out with an auger. The gathering of the herb is done by boys employed by the manufacturers, who pay a stated price per 100 pounds of material ready for use. When the barrel is filled with the herb, and the cover made tight with clay, the process of distillation goes on rapidly. The steam passes through a mass of herb, and is condensed by the tin tube into a mixture of distilled water and oil, and runs into a glass vessel set to receive it. Being of different densities, the oil and water rapidly settle into two strata, and one can be decanted from the other.

It is said that the operator of such a "still" can pay all running expenses and make a clear profit of $3 per day. When we consider that the cost of establishing such a "factory" is less than $10 for the entire plant, and no chemical education is necessary on the part of the operator, the profit of the work is not to be despised.

Messrs. Tarrant & Co. confirm some of the statements, and mention besides that the Carolinas furnish the best oil, and also the greatest amount, and that the bulk of oil is distilled from the wild plant. The farmers do most of the work with their crude stills, then trade the oil at the country stores, and through these dealers it gets into the general market.

Recluz states in his "Table of Volatile Oils" (Am. Jour. of Pharm., I, p. 133), that 25 pounds of fresh, flowering herb of Mentha pulegium yield 1 ounce 3 drams 39 grains of a citrine-colored oil. What the yield of oil from Hedeoma pulegioides may be I have not been able to ascertain.

CHEMICAL INVESTIGATION.

All information which I have been able to obtain about the chemical composition of this oil is expressed in the words of Professor Maisch on this subject in the National Dispensatory, p. 1062: "Oil of hedeoma contains oxygen, but its exact composition has not been ascertained."

The oils of the two closely allied plants, however, have been examined. The results of these examinations are to be found in Gmelin's Chemistry, xiv, 352, of which the following is an abstract:

1. The oil of Pulegium micranthum, a plant growing in the southern steppes of Russia, corresponds with that of Hedeoma pulegioides in being yellowish, after rectification, colorless or slightly yellowish, mobile, having a mint-like odor, a sp. gr. of 0.932 at 17°, and not solidifying at 17°. It, however, differs greatly in its boiling point, as it begins to boil at 202° and boils with tolerable regularity at 227°. Buttlerow found it to have the composition $C_{10}H_{16}O$.

2. The oil of Mentha pulegium, which is used in most European countries, has a sp. gr. of 0.9721 (0.927 Flück. and Hanb.), or 0.9255 for the rectified oil, and boils between 183° and 188°. Kane has given to it the formula $C_{10}H_{16}O$. On examining his analytical results it would seem that they correspond quite as well with the formula $C_{10}H_{18}O$.

Calculated for $C_{10}H_{16}O$.		Kane. Mean.	Calculated for $C_{10}H_{18}O$.	
C_{10} 120 . .	78.95 per cent.	77.79 per cent.	77.92 per cent.	120 C_{10}.
H_{16} 16 . .	10.52 per cent.	10.85 per cent.	11.69 per cent.	18 H_{18}.
O 16 . .	10.52 per cent.		10.38 per cent.	16 O.
Total 152 . .	99.99 per cent.		99.99 per cent.	154

The oil from Hedeoma pulegioides is described by our Pharmacopœia as "a colorless or yellowish liquid, of a pungent mint-like odor and taste, and a neutral reaction; sp. gr. about 0.940. It is readily soluble in alcohol." The two specimens of oil examined correspond quite well to these requirements, their sp. gr. being 0.932. The oil gave no reaction with ferric chloride nor with a saturated solution of acid sodium sulphite, indicating the absence of phenol or aldehyde-like bodies.

The analysis of the oil was conducted as follows: In the first place, 856 grams of oil were subjected to fractional distillation. The oil began to boil at 150°. The first fraction collected below 200° was slightly acid, and upon redistillation of the fractions the first or lowest one assumed a marked acid reaction. The oil having been perfectly neutral before fractionation, this was deemed sufficient proof for the presence of a compound ether. The fractions were therefore mixed, and the oil was treated with an alcoholic solution of potash, the following proportions being employed:

Oil	856.0
Potassa	85.0
Alcohol	1000.0

This mixture was boiled on a water-bath in a flask provided with an upright condenser. The boiling having been continued for more than eight hours, and the liquid still having a strongly alkaline reaction, saponification was deemed completed.

The alcohol was then distilled off from a water-bath and had a strongly aromatic odor, due to traces of dissolved oil, but upon redistillation from a fractionating vessel its boiling point was found to be quite constant at 78°, the absence of the other low boiling alcohols being thus ascertained.

To the remaining mixture of oil and solution of potassium salts a large quantity of water was added, and the oil distilled with the vapor of water by application of direct heat. From about 12 liters of distillate almost 500 c.cm. of oil were obtained. This was dried by means of potassium carbonate. The dried oil was exposed to temperature of from —10° to —15° for two hours, but nothing crystallized out.

The oil thus treated was now ready for fractionation. It began to boil at 140°, and the first fraction collected below 175°, when redistilled, began to boil at 110°. After repeated distillation the following fractions were obtained:

I	—160°
II	160°—170°
III	170°—180°
IV	180°—190°
V	190°—200°
VI	200°—210°
VII	210°—215°
VIII	215°—220°
IX	220°+

Fractions II, III and VI being the only large ones, ultimate analyses were made of them, the results being as follows:

	II.	III.	VI.
C	76.728 per cent.	75.531 per cent.	78.363 per cent.
H	11.527 per cent.	11.631 per cent.	11.539 per cent.
Total	88.255 per cent.	87.162 per cent.	89.902 per cent.

Adding the percentages of carbon and hydrogen (in none of the three cases amounting to 90 per cent.), and comparing these percentages with the theoretical percentages for $C_{10}H_{16}$, $C_{10}H_{16}O$ and $C_{10}H_{18}O$, it will readily be seen that these bodies cannot be terpenes, but more probably correspond to the formulas $C_{10}H_{18}O$ or $C_{10}H_{16}O$.

	$C_{10}H_{16}$	$C_{10}H_{16}O$	$C_{10}H_{18}O$
C	88.235 per cent.	78.947 per cent.	77.922 per cent.
H	11.764 per cent.	10.526 per cent.	11.688 per cent.
O		10.526 per cent.	10.383 per cent.
Total	99.999 per cent.	99.999 per cent.	99.993 per cent.

From the results of these analyses, and after closer study of the boiling points during the various fractionations, it was concluded that the greater portions of fractions II and III were one and the same body.

Taking these facts into consideration, fractionation was resumed and the following results were obtained:

Fractions.		Approximate Quantities.		Approximate Percentage.	
I	—158°	10 c. cm.			
	158°—165°	5 c. cm.			
II	165°—168°	20 c. cm.	72 c. cm.	15 per cent.	27.1 per cent.
	168°—171°	40 c. cm.			
	171°—174°	12 c. cm.			
	174°—180°				
	180°—185°	8 c. cm.			
	185°—190°	8 c. cm.			
	190°—195°	6 c. cm.			
	195°—200°	7 c. cm.			
	200°—203°	10 c. cm.			
III . . .	203°—206°	16 c. cm.	81 c. cm.	16.9 per cent.	30.5 per cent.
	206°—209°	45 c. cm.			
	209°—212°	20 c. cm.			
	212°—215°	8 c. cm.			
	215°—225°	8 c. cm.			
	225°—250°	15 c. cm.			
	250°—280°	7 c. cm.			
	280°+	20 c. cm.			
Total		265 c. cm.			

The fractions just below and above those marked II and III may properly be considered as belonging to fractions II and III respectively, and it is thus apparent that for analysis the fractions marked I, II and III only need to come into consideration.

1. FRACTION (—158°)

Although the fraction obtained below 158° was rather small, it seemed of interest to ascertain something about the nature of the body that had so low a boiling point. By careful refractionation a small fraction, boiling quite constantly between 74° and 77°, was finally obtained. It seems remarkable that this body should not have distilled over with the alcohol, since it has even a somewhat lower boiling point. The results of the two combustions of this substance are as follows:

I.—0.1577 gram of substance gave 0.3959 gram of $CO_2 = 0.1097 C$, and 0.1815 gram of $H_2O = 0.0202$ H.

II.—0.1723 gram of substance gave 0.4324 gram of $CO_2 = 0.1179 C$, and 0.2057 gram of $H_2O = 0.0228$ H.

Calculated for $C_5H_{12}O$.		Found.	
		I.	II.
C_5 60	68.18 per cent.	62.48 per cent.	68.42 per cent.
H_{12} 12	13.64 per cent.	12.80 per cent.	13.23 per cent.
O 16	18.18 per cent.		
88	100.00 per cent.		

Not having sufficient substance to make any further experiments, it was thought desirable to work up another quantity of oil by saponification with aqueous potash, thus entirely avoiding the use of ethyl alcohol, which corresponds so nearly with the first fraction in its boiling point, although differing widely in ultimate composition and other properties.

Eight hundred and fifty grams of oil were therefore boiled actively with a solution of 85.0 grams of potassa in 500.0 grams of water for from five to six hours. The operation was conducted in a copper flask provided with an upright condenser. After this the oily layer was separated and dried with carbonate of potassium. The dried oil, after repeated distillation, yielded a fraction between 65° and 75°. About 5 c. cm. of this fraction were obtained.

When submitted to analysis the following results were obtained:

I.—0.1536 gram of substance gave 0.3435 gram $CO_2 = 0.0936$ C., and 0·1606 gram $H_2O = 0.0178$ H.

II.—0.1902 gram of substance gave 0.4282 gram $CO_2 = 0.1167$ C., and 0.1999 gram $H_2O = 0.0222$ H.

Calculated for C_3H_7O.		Found.	
		I.	II.
C_3 36	61.02 per cent.	60.93 per cent.	61.35 per cent.
H_7 7	11.86 per cent.	11.58 per cent.	11.67 per cent.
O 16	27.12 per cent.		
59	100.00 per cent.		

On comparing these results with those above, one will immediately notice the great difference between them. This cannot as yet be explained, since the results obtained from the two analyses of each separate fraction correspond tolerably well with each other. It might be expected that the first portion could be contaminated with ethyl alcohol, as the boiling points of these two substances lie so close together. But ethyl alcohol has but 52.17 per cent. of carbon, and a contamination with it would necessarily diminish the percentage of carbon. However, the mean percentage of carbon in the first portion was found to be 68.45 per cent., whereas that of the second portion was found to be only 61.14 per cent. It should be considered, however, that these two fractions were obtained from two different portions of oil, that they were obtained by slightly different treatment, and that the one distilled between 74°–77°, and the other between 65°–75°. Although the degrees of temperature between which the second portion distilled are of a rather wide range, yet it may be stated that during the distillation, the mercury rose gradually between these two degrees, and then almost suddenly to 110°, thus proving it to be some definite body.

This portion resembled that obtained from the first quantity of oil in appearance and odor, the latter being slightly empyreumatic, somewhat reminding of that of methyl alcohol, but still quite distinct, and also somewhat fragrant. Like the body from the first portion of oil, previously referred to, it is insoluble in water; it is also readily soluble in alcohol, neutral to litmus, and did not reduce ammoniacal solution of silver nitrate. To ascertain whether it was an alcohol, the small portion that remained (0.85 gram) was treated in a fractionating vessel with 3.2 grams of acetyl chloride. The mixture immediately began to boil without the application of heat, and irritating fumes were given off. The orifice of the flask being tightly corked, it was placed in such a position that its tube could be connected with a reflux condenser. Being permitted to stand thus for about 15 minutes, the liquid assumed a red color, due to the hydrogen chloride generated. When heated the same irritating fumes were given off, and then, when passed into a solution of silver nitrate, caused a white precipitate to be thrown down, which was soluble in ammonia, and was reprecipitated by nitric acid. After expelling all the hydrogen chloride the liquid lost its red color. This liberation of hydrochloric acid would indicate that an acetyl radical had entered into combination, and that the body in question has the character of an alcohol.

On fractionating the liquid, it began to boil at 58° (boiling point of acetyl chloride). About one-half distilled between 57° and 67°, one-fourth between 67° and 125°, and about one-fourth remained in the flask. The fraction between 57° and 67° (about 1 to 1½ c. cm.) was a very light, colorless liquid, had a peculiar, slightly empyreumatic, but strongly acetic, pungent odor, and a marked acid reaction. It was too small to admit of further examination.

Judging from the method by which the original body was obtained, and from its properties, it appears safe to conclude that it is an alcohol.

The alcohols of the series $C_nH_{2n}+O$ to which its formula might correspond are the propyl alcohols. These, however, are miscible in all proportions with water, and have higher boiling points.

Of the alcohols of the series $C_nH_{2n}O$, allyl alcohol comes next to it as to percentage of carbon and hydrogen, but it is also miscible with water in all proportions, and boils at 96.6°.

If we double the assumed formula, thus making it $C_6H_{14}O_2$, it would agree equally well in composition with one of the five diacid alcohols, the hexylglycols. The boiling points of these alcohols, however, range between 171° and 207°.

On the other hand, assuming the first formula $C_5H_{12}O$ to be correct, it would come nearest the pentyl alcohols, but the boiling points of the seven isomers yet known are all above 102°.

Having no more material on hand, and not having the time at present to work a new quantity of oil, the composition and exact character of this body will have to remain an open question.

II. FRACTION (168–171°).

A colorless liquid of a strongly camphoraceous odor, reminding somewhat of lavender.

It was submitted to analysis with the following results:

I.—0.2341 gram of substance gave 0.6640 of CO_2=0.1811 C., and 0.2503 of H_2O=0.0278 H.

II.—0.1548 gram of substance gave 0.4432 of CO_2=0.1200 C., and 0.1700 of H_2O=0.0188 H.

III.—0.3770 gram of substance gave 1.0705 CO_2=0.2919 C., and 0.4062 of H_2O=0.0451 H.

Calculated for $C_{10}H_{18}O$.			Found.		
			I.	II.	III.
C_{10}	120 .	77.92 per cent.	77.36 per cent.	77.56 per cent.	77.44 per cent.
H_{18}	18 .	11.69 per cent.	11.87 per cent.	12.26 per cent.	11.97 per cent.
O	16 .	10.39 per cent.			
	154 .	100.00 per cent.			

III. FRACTION (206°–209°).

A thin, colorless liquid, assuming a yellow color upon standing, having a mint-like, somewhat camphoraceous odor, reminding slightly of pennyroyal.

The results of two analyses of this substance are:

I.—0.2708 gram of substance gave 0.7749 of CO_2=0.2113 C., and 0.2817 of H_2O=0.0313 H.

II.—0.3283 gram of substance gave 0.9364 of CO_2=0.2554 C., and 0.3469 of H_2O=0.0385 H.

Calculated for $C_{10}H_{18}O$.			Found.	
			I.	II.
C_{10}	120	77.92 per cent.	78.03 per cent.	77.79 per cent.
H_{18}	18	11.69 per cent.	11.52 per cent.	11.74 per cent.
O	16	10.39 per cent.		
	154	100.00 per cent.		

Although there is a difference of 35° between the boiling points of this fraction and the one preceding it, yet they appear to have the same composition. The occurrence of two bodies of the same composition in the same oil is not a frequent one. However, this case is not singular, for in the oil of Asarum canadense, L., this very substance occurs in two modifications whose boiling points differ 25°. In this case mentioned,* the derivatives and oxidation products have been studied carefully, and the products of both fractions were found to agree, thus proving their identity.

Should it seem desirable to give to these bodies a name whereby they

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* F. B. Power "On the constituents of the rhizome of Asarum canadense, L." Proc. Amer. Pharm. Assoc., 1880.

may be distinguished from other bodies of the same elementary composition, as found in various volatile oils, the name *hedeomol* may be proposed.

For want of time, I have not been able to study the fractions designated as II. and III. any further at present. There might appear to be some difference between them, as Fraction III. assumed a yellowish color upon standing, whereas Fraction II. remained perfectly colorless, their odor also being different. This coloration may, however, be due to a higher boiling substance with which it could be slightly contaminated. It would indeed be of great interest to establish the relation between these two substances, occurring in the pennyroyal with borneol, and its modifications occurring in the oils of Asarum canadense, Andropogon Schœnanthus, Andropogon Nardus, Valeriana officinalis, Pelargonium roseum, and other plants.

The portion of oil which distilled above 280° was viscid, almost resinous, and of a dark brown color. Regarding it as a mixture of decomposition products, nothing further was done with it. It is remarkable that the oil saponified with alcoholic potassa produced an immense amount of resin, whereas the amount of resin formed from the oil treated with aqueous potassa seemed comparatively very small.

ACIDS OBTAINED BY SAPONIFICATION.

I. The alkaline liquid remaining in the still after the distillation of the oil, being filtered and made strongly acid with dilute sulphuric acid (thus causing the separation of a very large amount of resin which was separated by filtration), was subjected to distillation as long as the distillate was decidedly acid. This acid distillate was marked *a*.

During this distillation, besides the acids soluble in water, a small amount of an oily acid distilled over (a few oily drops floating on the surface of the distillate). The greater portion of this oily acid, however, remained in the flask, and was extracted from the filtered liquid with ether. The residue left upon the evaporation of the ether was marked β.

II. The alkaline liquid separated from the oil treated with aqueous potash was rendered almost neutral with dilute sulphuric acid. The greater portion of the potassium sulphate having been separated by evaporation and crystallization, the remaining liquid was made strongly acid, when the liquid separated into two layers—a yellowish-brown aqueous liquid, and a brownish-black viscid, oily layer floating on its surface—but gradually falling drop by drop to the bottom of the flask. The two layers were separated by means of a wet filter. The aqueous filtrate, diluted with a large quantity of water, was distilled as long as the distillate had an acid reaction—*á*.

The oily acid remaining in the filter was partially purified by converting it into a barium salt, which, however, could not be crystallized. The barium salt was, therefore, decomposed with sulphuric acid and the oily acid was distilled over with water, again converted into a barium salt, and from this copper and silver salts were prepared. Barium salt marked, β'.

THE VOLATILE ACIDS SOLUBLE IN WATER.

a.—This acid distillate was digested with barium carbonate on a water-bath, and the mixture was filtered. The filtrate was evaporated to a small volume, the remaining liquid re-filtered, and this filtrate set aside over sulphuric acid to evaporate spontaneously. No crystals could be obtained, a merely gelatinous substance remaining, This being redissolved, its filtered solution gave the following reactions:

1. With solution of ferric chloride, a brownish precipitate. (This precipitate was later found to be due to the oily acid.)

2. The filtrate from this precipitate retaining a bright red color was heated, a brownish-red precipitate being formed.

3. With solution of silver nitrate, a white precipitate resulted, the silver salt, however, soon becoming reduced.

4. With solution of mercuric chloride, a white precipitate resulted, which, being collected on a filter, was blackened when treated with ammonia.

5. With solution of copper acetate, a blue precipitate resulted, which, like the iron precipitate, was found to be due to the oily acid.

6. After the addition of sulphuric acid, a rod moistened with ammonia water held into the tube caused the formation of white fumes.

Thus reactions 2 and 6 seem to indicate the presence of acetic acid, as also the white precipitate obtained by reaction 3 may be supposed to be due partly to acetic acid, partly to the oily acid. Reactions 3, and especially 4, seem to indicate the presence of formic acid. The reactions 1 and 5 were doubtless due to a heptoic acid, as will be seen by subsequent experiments.

b.—Taking these points into consideration, *b* which was perfectly free from any oily acid, was treated as follows: The distillate was digested with freshly precipitated lead carbonate.* The filtrate was evaporated to dryness over sulphuric acid, and the residue was treated with alcohol.

a. The alcoholic solution (acetate).

b. The residue not soluble in alcohol (formate).

A. The alcoholic solution was allowed to evaporate, and the residue was taken up with distilled water and the solution filtered. The filtrate gave the following reactions:

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*One of the distinguishing characters between formic and acetic acid (according to "Beilstein, Handbuch d. Org. Chemie.," p. 379) is, that the lead salt of the former is insoluble in alcohol Lead acetate, though insoluble in absolute alcohol, is readily soluble in ordinary alcohol.

1. With ferric chloride, a red coloration, and a reddish-brown precipitate on boiling.

2. On evaporating a few drops, mixing the residue with arsenic trioxide, and heating the mixture in a tube, the odor of dimethyl-arsenic was produced.

3. With solution of silver nitrate, a white precipitate resulted, which changed not in color within five minutes. (The quantity of silver salt was too small for analysis.)

B. The residue insoluble in alcohol was dissolved in distilled water, and the filtrate afforded the following reactions:

1 and 2. With ferric chloride and arsenic trioxide, the same reactions were obtained as in A 1 and 2, but not to such a marked degree. (Presence of a small amount of acetate.)

3. With solution of silver nitrate, a white precipitate resulted, which after a few moments darkened, soon becoming black. (Beilstein mentions the reduction of the silver salt to metallic silver, carbon dioxide, and formic acid, as a distinguishing characteristic between silver formate and acetate.)

Thus by the solubility of the lead salt in alcohol, and by the reactions A, 1, 2, and 3, the presence of acetic acid was confirmed. The insolubility of B in alcohol and the reactions β 3 and α 4 also confirm the presence of formic acid.

THE OILY ACID INSOLUBLE IN WATER.

β. The ethereal solution of the oily acid, only a small part of which had distilled with water, being allowed to evaporate spontaneously, a thick, viscid substance remained, which was slightly soluble in hot water, but separated out upon cooling, forming two distinct layers; The barium salt of this acid would not crystallize, but upon evaporation of the solution a gelatinous mass resulted, the solution of which gave the following reactions:

1. With copper acetate, a blue precipitate resulted.

2. With silver nitrate, a white precipitate resulted, which was more stable than the silver salts of the volatile acids, and was insoluble or nearly so in cold water.

3. With ferric chloride, a reddish brown precipitate resulted, which was soluble in alcohol.

From the barium salt the copper and silver salts were prepared for analysis.

β'. From the barium salt prepared from the purified acid the copper and silver salts were prepared. Before ignition the salts were heated at 100° until of constant weight.

Estimation of CuO by Ignition of the Copper Salts.

Calculated for $Cu(C_7H_{13}O_2)_2$	Found	
Cu=19.7 per cent.	β—19.1 per cent.	β'—20.9 per cent.

Estimation of Ag Obtained by Ignition of Silver Salts.

Calculated for $AgC_7H_{13}O_2$	Found	
Ag=45.5 per cent.	β'—45.6 per cent.	46.6 per cent.

Thus this oily acid appears to be a heptoic acid, and, judging by the character of its salts, isoheptoic acid. The barium salt of heptoic acid, according to Beilstein, is scaly, and its solution contains but 1.7 parts of the salt in 100 parts. The barium salt of isoheptoic acid consists of microscopic crystals, or, according to Roscoe and Schorlemmer, constitutes an amorphous mass, and 100 parts of water dissolve 30 parts of the salt. Copper heptoate, when recrystallized from alcohol, forms green prisms. I was not able to obtain my copper salt, which had a light green color, in a crystalline form.

Thus judging from the uncrystallizable character of the barium salt,* its ready solubility in water, the amorphous character of its copper salt, the miscibility of the acid with ether, and the character of its silver salt, I feel justified in regarding it as isoheptoic acid. If larger quantities of acid had been obtainable, I should have examined its boiling point, as the boiling point of heptoic acid is 222.4°, and that of isoheptoic acid 211.5°, thus more than 10° apart.

I once more call attention to the fact that these acids are present only in exceedingly small quantities. Of the volatile acids there was not enough present to prepare any salts for analysis, and of the oily acid only sufficient of the salts could be prepared to make one or two analyses. In both cases the small amount of these acids was all that could be obtained from nearly 2 pounds of oil.

That these acids are present in the original oil as ethereal salts is evident from the fact that the original oil was perfectly neutral and became acid by repeated fractionation, a process which effects the partial decomposition of compound ethers.

The alcoholic nature of borneol and its numerous isomers, as contained in many volatile oils, having since been established,† it is probable that the acids here found are in combination with this substance, at least for the most part. It is, however, possible that a portion of the acids are in combination with the body constituting the lowest boiling fraction of the oil, if its apparent alcoholic nature be correct.

Whether these acids are formed by the oxidation of the borneol con-

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* Though the acid obtained from the second quantity of oil seemed to be perfectly pure.

† Berthelot.

tained in the oil, as is highly probable, would be an interesting subject for further investigation.

The results of the analysis may be summarized as follows:

I. A low boiling alcohol, the products obtained from two different quantities of oil, and, according to slightly modified processes, apparently differing. The nature of this body, therefore, remains to be determined.

II. A body of the composition $C_{10}H_{18}O$, which may be designated as *hedeomol*, occurring in two modifications of different boiling points. Their derivatives and oxidation products remain to be studied.

III. Formic Acid:
  1. Its silver salt became reduced almost immediately.
  2. Its barium salt reduces $HgCl_2$ to $HgCl$.
  3. Its lead salt is insoluble in alcohol.

IV. Acetic acid:
  1. Its iron salt is soluble in water, imparting to it a bright red color, and becomes precipitated on boiling.
  2. Its silver salt is white, and does not become darkened within five minutes.
  3. Its lead salt, when heated with arsenic trioxide, gives the kakodyl reaction.
  4. The free acid causes the formation of white fumes with ammonia.

V. Isoheptoic acid:
  1. Determined by the analyses of its salts.
  2. Its barium salt is amorphous and readily soluble in water, which distinguishes it from the normal heptoic acid.

NOTE.—A desire to do some work in connection with volatile oils led me to undertake, upon the advice of Prof. Dr. F. B. Power, the analyses of the oils of pennyroyal and citronella.

It was due chiefly to the kind supervision of Professor Power, in whose laboratory the chemical investigation was conducted, that I am able to present the results in the present degree of completeness.

I am also indebted to Messrs. Fritzsche Bros., who kindly furnished the oils, and afforded me the satisfaction of having worked with pure materials.

To these gentlemen, and particularly to my esteemed and honored teacher, Professor Power, I desire to render my most hearty thanks.—E. KREMERS.

CHEMICAL EXAMINATION OF THE OIL OF ANDROPOGON NARDUS, L., OR CITRONELLA OIL, WITH A REVIEW OF THE DIFFERENT SPECIES OF ANDROPOGON OF INTEREST IN PHARMACY.

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A contribution to the meeting of the American Pharmaceutical Association held in Cincinnati, September, 1887.

While engaged in a chemical examination of the oil of citronella, it seemed of interest to ascertain something further regarding its botanical and commercial sources, extent of production, etc., especially since the references relating thereto in our literature are deficient and meagre. It was also evident in pursuing the investigation in this direction that the names, synonyms, and other general statements occurring in many of the journals and cyclopædias are quite incorrect and misleading.

Under these circumstances it was considered of special importance, in connection with the chemical investigation, that the source of the oil in question be definitely determined, as also that the relation which it bears to other allied oils, with which it is frequently confused, should be clearly established. I therefore introduce my paper with the botanical origin of several species of andropogon, and subsequently give a list of their synonyms, together with some points of interest connected with their history, and the uses to which either the plants or their products have been applied.

Under the headings "Derivation of Name" and "Production" I treat of the citronella oil only, as an extension of these subjects is not necessary for the completeness of this paper.

The following books and journals have served me as sources of information in reviewing the different species of andropogon and their products:

Pharmacographia, Pharmacognosie, National Dispensatory, Luerssen's Med. Pharm. Botanik, Gray's Manual of Botany, Universal Pharmakopoe, Pharmacopée Française, N. Farmacopea Mexicana, Am. Homœopathic Pharmacopœia and others, British Cyclopædia, American Cyclopædia, Library of Universal Knowledge, Johnson's Cyclopædia, Webster, Littré, Dictionnaire Français, Pritzel & Jessen, Die Deutschen Volksnamen der Pflanzen, American Journal of Pharmacy, Pharmaceutische Rundschau, Schimmel & Co's Handels Bericht, Mai, 1887, Report of Committee on the Centennial Exhibition, Proc. A. P. A. xxiv., 769.

BOTANICAL ORIGIN.

Of the genus Andropogon 66 species were known by Linné. Quite a number grow in the United States, but seem to be devoid of aromatic properties.

[*] Those of interest to us at present are the following:

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[*] Exact descriptions of the genus Andropogon, and of the species of importance in pharmacy, can be found in Luerssen's Med. Pharm. Botanik, II.

1. *Andropogon Nardus, L.*

A noble looking plant, rising when in flower to a height of six or more feet. It is extensively cultivated in Ceylon, on the Malabar Coast, and in the Straits Settlements near Singapore, for the production of citronella oil.

2. *Andropogon citratus, DC.*

A large, coarse, glaucous grass, cultivated in Ceylon and Singapore, but at present to a larger extent in India and the Malay Peninsula. It grows also in Java, in the West India Islands, and in Mexico in some warm places. It is also commonly met with in gardens throughout India, and is not infrequent in English hot-houses. It grows in light soil, needs but very little culture, but requires considerable moisture. The lemon grass oil is distilled from it.

3. *Andropogon Schœnanthus, L.*

Grows abundantly wild in Central India and in the Northwest Provinces, but more sparingly in Southern India (Punjab).

It affords the fine geranium or palmarosa-oil and the ordinary ginger grass oil. It is not known in which relation these two oils stand to each other.

4. *Andropogon laniger, Desf.*

This plant is widely distributed in hot, dry regions of Northern Africa (Algeria), Arabia, and Northwestern India, reaching Thibet, where it is found up to an elevation of 11,000 feet. It has an aromatic, pungent taste, which is retained in very old specimens. No essential oil is distilled from it.

5. *Andropogon muricatus, Retz.*

A large grass found abundantly in rich, moist soil in Southern India and Bengal. Its long, fibrous roots enter the market under the name of cuscus or vetiver.

6. *Andropogon cariosus, L.*

A plant which, like couch-grass, spreads with astonishing rapidity over the fields, growing so close together and so high that within a short space of time valuable plantations are rendered useless, and may have to be given up, from the utter impossibility of freeing the ground from this weed. It is, however, killed by the refuse from gambir leaves. Therefore, gambir and pepper plantations are always combined.

DERIVATION OF NAME.

Andropogon, from the Greek words ἀνήρ, ἀνδρος, man, and πωγων, beard, from the fact that many representatives of this genus have the sterile or staminate flowers bearded; hence, also, the synonym, beard grass (Bartgras).

Nardus.—Eng., närd; A. S., nard; O. H. Ger., narda, nardo; M. H. Ger. and Goth., nardus; N. H. Ger., narde; Fr., nard; It. and Sp., nardo; Lat., nardus; Gr., νάρδος; Heb., nêrd; Ar., nardîn, nârdin; Pers., nard, nârd; Old Pers., narda, from Shr., nalada, from nala, perfume, and da, giving, from dâ, to give.

The *nard*, or *spikenard*, as it is more commonly called at present, was a perfume highly prized by the ancients, and used both in baths and at feasts. Probably this name was given to this species of andropogon because it was supposed by some to yield the genuine *nard*, or on account of the fragrance of the oil distilled from this plant. Something more about this will be stated when the history of this plant is considered.

Citronella.—This word is probably a diminutive of citron, as the Fr. prunelle is the diminutive of prune; Lat., prunus.

The citron—Fr., citron; Lat., citro; Gr., κίτρον; Lat., citreum (malum being understood)—is the fruit of Citrus medica. Its rind, preserved in sugar, forms the citron of the shops.

SYNONYMS.

Under this heading, it is my desire not only to give the few synonyms applied to andropogon nardus, but also others which in some works have been incorrectly given to it; also to show where these synonyms belong.

Andropogon Nardus, L.

Andropogon Martini, Thwaites—Enum. Plantarum Zeylaniæ nec aliorum.

[2]Citronella.

[3]Cassal al darira—Plantæ Exoticæ.

[4]Spikenard—In England (Webster).

Andropogon citratus, DC.

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[2] The term *citronella* is also applied to:

a. A perfume prepared from the melissa or common balm.

b. A liquid prepared in Barbadoes, which is used in France for flavoring the best brandies. From Littré, Dictionnaire Français, I quote the following: "Liqueur qui se nomme aussi Eau de Barbades, et qui si fait avec des écorces extérieures de citron, bien mûres et séchées au soleil, sur lesquelles on verse une quantité proportionée de la meilleure eau de vie."

c. The oil of Andropogon Schœnanthus—*i. e.*, as stated by Johnson. He states that the term citronella is at present chiefly applied by perfumers to the above-mentioned oil. How much truth there is in this statement I am not able to say.

d. Artemisia Abrotanum, L., called "Aurone male ou Citronnelle" by the French Pharmacopœia. It grows in Southern Europe and has a lemon-like odor.

e. Melissa officinalis, L., also called "Citronnelle" by the French Pharmacopœia.

[3] In 1640 Prosper Albinus, in Plantæ Exoticæ, gave the figure of a plant from Egypt, which he termed *cassal al darira*. Linnæus, however, refers it to his Andropogon Nardus.

[4] In the United States the name "Spikenard" is given to the Aralia racemosa, L.

A. citratum, A. P. Decandolle.—Catalogus Plantarum Horti, Botanici Mouspeliensis, 1813.

Andropogon Schœnanthus, Wallich.—Plant. Asiat. rariores iii, tab. 280, 1832.

Roxbury, Flora Indica, i, 278, 1820.

Lemon Grass Oil (Lemongras Oel).

Oil of Verbena.

[5] Indian Melissa Oil (Indisches Melissen Oel).

Sireh.—Java.

Oil of Spikenard?—Library of Universal Knowledge.

Andropogon Schœnanthus, L.

Andropogon Martini, Roxb.—Flor. Ind., i, 280, 1820.

Andropogon pachnodes, Trinius.—Species graminium, iii, tab. 237, 1836.

Andropogon calamus aromaticus, Royle.—Illustrations of Botany of Himalayan Mountains, 1839.

Rusa Gras.—Bericht von Schimmel & Co., April, 1887.

Ventenat.—Jardin de Cels, tab. 89, 1803.

Rúsa Oil, Rusa öl.
Oil of Ginger Grass. { Ingweröl } Pharmacognosie.
Oil of Ginger Grass. { Gingergras oel.
Palmarosa-œl
Oil of Geranium (Geranium-oel. } Bericht von Schimmel & Co., April, 1887.
[6] Indisches Geranium oel.
[7] Turkish Oil of Geranium—Nat. Disp., p. 1082.
[8] Oil of Namur, or
[9] Rúsa-ka-tel.

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[5] Flückiger (Pharmacognosie, 695) says of the Lemon-grass oil: "Der Geruch dieses Oeles ist demjenigen des Melissen öles nicht unähnlich, doch viel schärfer." Thus it is apparent that this name was given to the oil of A. citratus, on account of the similarity of its odor to that of the oil of Melissa officinalis.

[6] *Indian*, in distinction from the French and Spanish Geranium oil, which is obtained from the Pelargonium roseum, Willd., and which is also used to adulterate oil of rose.

[7] *Turkish*, from the fact that at least the greater bulk of the oil in European commerce was obtained via Turkey, whither it was brought at first for the adulteration of oil of rose. The importance this article assumed demanded that it be imported more directly. European houses, therefore, no longer obtain this oil via Turkey, but are in direct communication with Indian houses. Schimmel & Co. (Berichte, April, 1887). therefore desire that the adjective *Turkish* be dropped, which, indeed, would be proper.

[8] Oil of Namur, Nimar, or Namar, are terms applied to the oil produced in the Namar district. (Fl. & Hanb, p. 726.)

[9] A term used in Hindustan. (Fl. & Hanb.)

[10] Rusa.
Row-Sah.
Roshé.
Rosa. Mentioned in the National Dispensatory as the oil used to
Rosé. adulterate oil of rose.

[11] Idris yaghi.
Enterschah.

Andropogon laniger, Desf.

[12] Andropogon Schœnanthus, L.
Cymbopogium Schœnanthus, Spr.
Fœnus camelorum.
[13] Jucus odoratus.
Schœnanthus. Middle Ages.
Squinanthus.
Wohlriechende Binse.
Cameleshov, höuwe. [14] Synonyma apothecarum.
Candisch Heu.
Kameelheu, —stroh.
Squinant. [14] Synonyma apothecarum.

Herba Schœnanthi vel Squinanthi.
[13] Juncus odoratus. Pharmacographia.
Khàvé ——Mr. Tolbort (1869).

Andropogon muricatus, Retz.

Cuscus grass.
[15] Khus-khus. Pharmacographia.
Vetti-ver. Malyalim name.

Antherum muricatum.
Vetivera odorata.
Vivana.
Bena. Amer. Homœopath. Pharmacop., ii.
Vetiver.
Viti-vayr.

Andropogon caricosus, L.

Lalang. "Hooker's Journal of Botany."

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[10] Hindustani terms under which it is exported in large quantities from Bombay to the ports of Arabia (Jidda), whence it is carried to Turkey by Mohammedan pilgrims.

[11] Terms applied to the oil by the Turks. (Pharmacognosie and Nat. Disp.)

[12] Taken from Pritzel & Jessen: "Die deutschen Volksnamen der Pflanzen," who give them as synonyms of Andropogon Schœnanthus. This, however, appears to be an error, as Flückiger ascribes several of the synonyms as belonging to A. laniger, Desf., and also speaks of its use in Germany during the Middle Ages.

[13] The difference between these two terms probably was created through an error in copying.

[14] The "Synonyma Apothecarum sive Vocabularis Simplicium" is a lexicon of drugs which was in universal use in Germany in the first half of the fifteenth century.

[15] A name adopted by the English in India. It is probably from the Persian Khas. (Pharmacographia.)

HISTORY.

It appears quite evident that Pliny and the ancient writers on natural history have indiscriminately applied the name *nardus* to different plants, so that the utmost difficulty has attended all attempts to ascertain what vegetable furnishes the true oil of spike. Most cyclopædias at present attribute the true oil of spike, according to Dr. Royle, to the Nardostachys jatamansi, Nat. Ord. Valerianaceæ. The oil of spike prepared from different species of valeriana is said to have been used as a substitute.

Sir William Jones (Asiatic Researches, iv., 109) is of the opinion that the spikenard of the ancients was a product of a graminaceous plant. This supposition is sustained by Celsius (Hierobotanicon). Rottler and Sir Wm. Blane ascribe it to the andropogon parancuia, the essential oil of which is much used in the East as a stimulant.

"The aromatic properties of certain species of andropogon were well known to Rheede, Rumpius and other early writers on Indian natural history, and an oil distilled from Sireh grass (andropogon citratus) in Amboyna was known as a curiosity as early as 1717 (Ephemerides Naturæ Curiosorum, 1717).

"But it is only at very recent times that the volatile oils of these plants have become objects of commerce with Europe. Lemon grass oil is mentioned by Roxbury in 1820 as being distilled in the Moluccas; and it was first imported into London about the year 1832. Citronella oil is of much more recent introduction. Ginger grass oil is stated by Waring (Pharmacopœia of India, 1868, p. 465) to have been first brought to notice by Dr. N. Maxwell in 1825.

"The andropogon laniger has had a place in pharmacy from the days of Dioscorides down to the middle of the last century, and is still met with in the east."

"The andropogon muricatus has been used for centuries up to the present day. Inscriptions on copper plates discovered about 15 years ago (about 1855) in the district of Etawah, southeast of Arga, and dating from A. D. 1103 and 1174, record grants of villages to Brahmins by the kings of Kananj, and enumerate the imposts that are to be levied. Cuscus grass is one of them (Proc. of Asiat. Soc. of Bengal, August 1873)."

Of all these plants but two are officinal. Tne andropogon muricatus, Retz, is officinal in the American Homœopathic Pharmacopœia ii, under the title of Antherum muricatum. The Andropogon citratus, DC, is officinal in the Nueva Farmacopea Mexicana, under the title of Té Limon.

N. B.—The quoted sentences are abstracted from the Pharmacographia.

USE.

The foliage of the large odoriferous species of andropogon is used in India for thatching. The long fibrous roots of andropogon muricatus serve in India for making tatties or screens, which are placed in the windows and doorways, and when wetted diffuse an agreeable odor and coolness. They are also used for making ornamental baskets and many small articles. Some of these plants are eaten voraciously by cattle, whose flesh and milk become flavored with its strong aroma. The lemon grass is too coarse to be eaten by cattle except when young, and is therefore often burned down. The herba schœnanthi (A. laniger) had some reputation as a medicine, and the vettiver (A. muricatus) still has. Europeans in India make an agreeable stomachic and tonic tea from the fresh leaves of lemon grass. In Mexico it is used for the same purpose and costs 50 cents per kilo. (Rep. of Cent. Com.)

The grass oils are highly esteemed in India for external application in rheumatism. Internally they are sometimes administered as a carminative in colic. That the medicinal properties of these oils are of no great importance can be readily seen from the fact that none of them are officinal.

The chief use of these oils, or probably almost exclusively that of the oil of andropogon schœnanthus, has been for the adulteration of rose oil. It appears that through this circumstance the oil has been brought into European commerce. According to Baur, the oil is transported in large galvanized copper flasks from Bombay to the Red Sea, and thence through Arabian merchants and pilgrims to Constantinople and Kazanlik. The odor of this oil, already quite pleasant, is, however, improved by shaking it with water to which lemon-juice has been previously added. This operation also removes traces of copper. The washed oil is exposed in shallow dishes to the sunlight for two or three weeks. The odor of the oil is thus made to approach that of rose oil more than before.

The steady increase in the exportation of citronella oil (A. Nardus) to European countries (Turkey excl.) and America shows that at least one of these oils has found extensive application or use outside that of an adulterant for rose oil. It is said that it is used almost exclusively by soapmakers and perfumers. It may be of some interest to ascertain whether this alone is true, or whether this oil has found any other use besides this.

COMMERCE.

The export of citronella oil appears to be at present at its maximum height. The natural result of the overproduction of the oil is that the culture of the grass and the distillation of the oil no longer pay, and have already been given up by many. Its growing trade, and especially the enormous increase of its exportation within the last few years, may be clearly seen from the following statistics:

	Ounces.
Export from Ceylon in 1864	622,000
1872	1,595,257
1881	1,760,677
1882	2,666,912
1883	3,335,780
1884	4,827.620
1885	5,721,112
1886	6,461,278

Schimmel & Co. stated in their "Bericht," 1885, that the production of this oil had increased in Ceylon and the Straits Settlements, but that the amount consumed did not appear to increase in the same proportion. In 1886 not less than 9000 casks were exported from Ceylon. Fritzsche Bros. alone contracted for not less than 3000 casks. (Last year not less than 10,000 acres in the western and southern districts of Ceylon were cultivated with citronella grass.)

The last year's consume is divided among the following countries:

	Ounces.
England	3,623,701
America	2,585,136
Hamburg, etc	162,360
India, etc.	56,829
Marseille	20,592
Australia	12,660
Total	6,461,278

Oil of lemon grass, which is a more costly article, and less extensively produced, was exported from Ceylon during the year 1875 to the extent of 13,515 ounces, more than half of which quantity was shipped to the United States. Its export from Ceylon has diminished considerably. It amounted to 8719 ounces in 1885, and 5882 in 1886.

There are, however, analogous statistics from India and the Malay peninsula, from which countries it is exported in much larger quantities.

In 1867, 41,634 pounds of ginger grass oil were shipped from Bombay to England and ports of the Red Sea. I have not been able to obtain any other statistics on the commerce of this oil.

PRODUCTION OF THE OIL.

According to Consul Freudenberg, the German consul in Colombo, the oil of citronella is produced almost exclusively in the Southern provinces of Ceylon, partly by the rich natives, holding the larger plantations, and partly by the poorer ones, who plant their small plots of land with citronella grass. The former carry on the distillation in a regular apparatus, by means of steam; the poorer ones boil their grass in small kettles, and construct with earthen vessels a primitive distillatory apparatus. Only one farm is in the hands of Europeans. The oil is distilled throughout nearly the whole year, though December—January, March—April, July—August are the most favorable periods. At present prices the pooer natives can only hold their own by performing all the labor themselves, but the richer ones manufacture on more rational principles, and therefore more cheaply. A well-managed plantation will yield 24 flasks per acre three times a year (together about 45 kg.), an inferior one only 18 flasks a year. One of the chief difficulties in the industry is the want of fuel.

Some years since citronella oil was much adulterated with petroleum, but this was easily detected by observing the sp. gr., so that the natives have now given up the practice. In India it has also been adulterated by the natives with fatty oil.

CHEMICAL INVESTIGATION.

In 1844[16] Stenhouse examined oil of ginger grass given to him by Christison as oil of namur. It consisted of a hydrocarbon mixed with a small proportion of oxygenated oil and 50 per cent. of resin. The oxygenated portion decomposed by sodium and rectified proved to be isomeric with oil of turpentine. Consequently the oxygenated oil was probably of the composition $C_{10}H_{18}O$.

About the year 1871 or 1872[17] Gladstone analyzed an oil which he calls citronella oil, but which was the oil of andropogon schœnanthus. He separated a fraction boiling between 199°–205°, for which he determined the formula $C_{10}H_{16}O$. From the statements made in the Pharmacographia, p. 727, it is evident that Flückiger (Pharm. Chemie., p. 315), refers to this analysis in stating that a portion of the citronella oil has the composition $C_{10}H_{16}O$.

A few years later[18] C. W. A. Wright examined a certain fraction of the oil of andropogon schœnanthus, which he also calls citronella oil. He also retains the term citronellol for a certain fraction of it, although he finds it to have a different composition. On distilling, the greater part of the oil was found to pass over between 195° and 240°, but of this the greater part (boiling near 210°) was found to be considerably altered by continued heating,[19] decomposition resulting, water and a substance boiling above 220° being produced.

About two-fifths of the substance originally used, distilling below 230°, were found to have the composition $C_{10}H_{18}O$. Flückiger mentions this also in his Pharm. Chemie (314), in connection with the oil of andropogon schœnanthus.

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[16] Mem. of Chem. Soc. ii (1845), p. 122.

[17] Chem. Soc. Journ. (2), x., 7.

[18] Chem. Soc. Journ. (2), xii., 317.

[19] A similar reaction takes place when cajuputol, $C_{10}H_{18}O$ is distilled. Flückiger, Pharm. Chem. and Nat. Disp., 1054.

[20] Schmidt states that the oil of andropogon schœnanthus consists chiefly of geraniol, $C_{10}H_{18}O$, a monatomic alcohol, sp. gr. 0.8851 at 15°, and boiling at 232°–233°.

Thus all these statements can be referred to the oil of andropogon schœnanthus. The only statement to my knowledge that is made of the chemistry of the citronella oil proper, the oil of andropogon nardus, is made by [21] Flückiger. He states that he has observed "that the oils both of lemon grass and citronella yield solid compounds if shaken with a saturated solution of bisulphite of sodium." The latter statement, therefore, furnished the only point for consideration in my chemical investigation of the oil.

The oil used, as previously stated, was received through the kindness of Messrs. Fritzsche Bros. It represents a pale yellowish-brown liquid, assuming a greenish color when exposed to light, and having a fragrant characteristic odor, a pungent taste, and a neutral reaction. Its sp. gr. is 0.8833. It is miscible with alcohol in any proportion, and gives no reaction with ferric chloride. When shaken with an equal volume of a concentrated solution of bisulphite of sodium a mass of crystals resulted, thus showing the presence of an aldehyde or possibly a ketone.

The greenish color mentioned is due to the presence of copper combined with one of the acids contained in the oil. About 5 cc. of the oil which had been exposed to sunlight were shaken with an equal volume of water previously acidulated with a drop of hydrochloric acid. The greenish color disappeared immediately, the oil becoming perfectly colorless. The aqueous layer tested with solution of potassium ferrocyanide produced a reddish-brown color.

Nine hundred grams or more of the oil were shaken thoroughly with three to four times their volume of a concentrated solution of sodium bisulphite. The white magma which resulted was brought on a filter and drained, and the adhering oil was removed by repeated washing with alcohol.

The oil obtained by distilling off the alcohol, and that obtained from the liquid separated by filtration of the mixture of aldehyde compound, oil and sodium bisulphite solution, were free from aldehyde, as was ascertained by shaking it with another quantity of concentrated sodium bisulphite solution.

The aldehyde compound was decomposed with dilute sulphuric acid with the aid of gentle heat, sulphur dioxide being given off abundantly. The aldehyde was then separated, about 100 c.cm. being obtained. To remove the sulphur dioxide, peroxide of lead was tried. It destroyed the odor of the sulphur dioxide quite readily, but it itself could not be removed from the aldehyde without decomposing the latter. Fused po-

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[20] Pharmaceutische Chemie ii., 850.

[21] Pharmacographia, 727.

tassium carbonate was then tried with more success, as it removed both sulphur dioxide and water, and could be separated quite readily from the aldehyde.

Being assured of the absence of any aldehyde, the oil separated as stated above was dried in contact with calcium chloride. Upon fractionation the following results were obtained:

		Approximate Percentage.
I	210°	5 per cent.
II	210°—230°	30 per cent.
III	230°—250°	40 per cent.
IV	250°—270°	10 per cent.
V	270°—	15 per cent.

All the fractions had a more or less acid reaction. It thus became evident that a continual decomposition of a compound ether or ethers was going on. Therefore the fractions were mixed, and saponified with an alcoholic solution of potassa. The following proportions were employed:

Oil	335.0 grams.
Potassa	33.5 grams.
Alcohol	335.0 grams.

After this mixture had been boiled for 14 hours, the alcohol was distilled off. The saponified oil was poured into a large quantity of water, when but little resin separated, and the oil was regained by distillation. This oil was dried by contact with potassium carbonate and fractionated. The final results of the fractionation were:

I	200°	10 c. cm.
	200°—210°	3 c. cm.
	210°—217°	10 c cm.
II	217°—222°	50 c. cm.
III	222°—230°	35 c. cm.
	230°—240°	Each but a few cubic centimeters.
	240°—250°	
	250°—260°	
	260°—270°	
	270°—280°	
	280°—290°	
	290°—300°	
	300°—325°	7 c. cm. each—decomposition products.
	325°+	

The fractions marked I., II. and III. were set aside for analysis; the others were deemed not important enough to require further attention.

The liquid remaining in the still was filtered, and the filtrate evaporated. It necessarily contained the potassium salts of the organic acids contained in the oil, and was to be worked for these.

THE ALDEHYDE,

A pale yellow, viscid liquid of an agreeable geranium-like odor and pungent taste; sp. gr. 0.942.

To determine its boiling point and to purify it, if possible, it was fractionated. At the second round the first fraction began to boil at 140° C., and between 200° and 230° fractions were collected within 5°. Each fraction, however, was very small. The aldehyde could be made to distill somewhat rapidly only by heating it to 285°. The mercury even rose as far as 330° C. The aldehyde was evidently decomposed under these conditions.

20–30 c. cm. of aldehyde were then distilled in a current of dry carbon dioxide, but even this precaution did not prevent its decomposition. About one-third distilled between 210° and 240°; another third between 240° and 270°. Both fractions were viscid, and the portion remaining in the flask even more so, and of a dark brown color. All the fractions had a disagreeable odor, which they lost by age.

As there seemed to be no means of further purifying the aldehyde without decomposition, it had to be analyzed in its present state of purity. The results of two analyses are:

I.—0.2511 gram of substance gave 0.6774 gram of CO_2=0.1847 C, and 0.2683 gram of H_2O=0.0298 H.

II.—0.2132 gram of substance gave 0.5760 gram of CO_2=0.1571 C, and 0.2300 gram of H_2O=0.0255 H.

Calculated for $C_7H_{14}O$.		Found.	
		I.	II.
C_7	73.68 per cent.	73.56 per cent.	73.69 per cent.
H_{14}	12.28 per cent.	11.87 per cent.	11.96 per cent.
O	14.04 per cent.		
	100.00 per cent.		

Thus this body seems to correspond with heptaldehyde, œnanthaldehyde or œnanthol, $C_6H_{13}COH$.

As already mentioned, its boiling point could not be accurately ascertained. It reduces ammoniacal solution of silver nitrate, producing a mirror when a relative large quantity of the aldehyde is used.

Treated with fuming nitric acid a vehement reaction takes place, nitric fumes are given off, and a soft, yellow, resinous substance is produced.

Saturated with dry ammonia gas no change whatever seemed to take place. When ammonia gas was passed into an ethereal solution of the aldehyde, a flocculent precipitate occurred.

It is doubtful whether this substance is identical with the known œnanthaldehyde. When œnanthaldehyde is oxidized with [22]potassium bichromate and sulphuric acid, normal heptoic or œnanthylic acid, $C_6H_{13}COOH$, is produced. When treated with [23]alcoholic potash, œnanthylic acid and other products are formed.

It however appears safe to assume, as will be shown later on, that this compound when oxidized splits up into two acids having less carbon atoms.

I. FRACTION (—200°).

This fraction began to boil at 170°, but, like the next fraction (200°-210°) it appeared to have no constant boiling point. The entire fraction with its wide range of boiling point was therefore analyzed with the following result:

0.2447 grams of substance gave 0.7317 gram of CO_2=0.1995 C, and 0.2584 gram H_2O=0.0287 H.

Calculated for $C_{15}H_{24}O$.		Found.
C_{15}	81.82 per cent.	81.52 per cent.
H_{24}	10.91 per cent.	11.32 per cent.
O	7.27 per cent.	
	100.00 per cent.	

It is not very probable, however, that this low boiling fraction should have this composition, as most oxygenated bodies with even a less number of carbon atoms have higher boiling points. Judging from its boiling point it is more likely to be a hydrocarbon rendered impure by contamination with the higher boiling oxygenated fraction. Assuming the latter supposition to be correct, this fraction was treated with metallic sodium. The sodium was allowed to act on the oil for 24 hours without the aid of heat, hydrogen being slowly liberated. After this it was distilled with the excess of sodium, little more than a third distilling between 160° and 170°. A comparatively large amount of resinous and carbonaceous matter remained in the flask. Finally, this fraction was redistilled with bright metallic sodium.

The results of an analysis of this fraction thus treated are as follows:

0.2382 gram of oil gave 0.7474 gram of CO_2=0.2038 C., and 0.2619 gram H_2O=0.0291 H.

Calculated for $C_{10}H_{16}$.		Found.
C_{10}	88.24 per cent.	85.55 per cent.
H_{16}	11.76 per cent.	12.21 per cent.
	100.00 per cent.	97.76 per cent.

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[22] Roscoe & Schlorlemmer, III., 1, 648.

[23] Beilstein, I, 778.

It is evident that the percentages of carbon and hydrogen calculated from the results of this analysis correspond poorly to the theoretical percentage called for, $C_{10}H_{16}$. However, they correspond better to those calculated for $C_{10}H_{10}$ than to those of other hydrocarbons found in volatile oils, and which boil at a similar temperature. Besides this fraction two (II.), which will be shown to be a body of the composition $C_{10}H_{18}O$, and with which this lower fraction is likely to be contaminated, is but very slowly acted upon by metallic sodium.

Flückiger ("Pharm. Chemie," 352) states that the cajuputol, a body from the oil of melaleuca leucadendron, L., having the composition $C_{10}H_{18}O$, can be rectified unchanged over metallic sodium. E. Jahns ("Berichte," '84, 2941) states that eucalyptol, an isomer from the oil of eucalyptus globulus, is not at all, or at most very little affected by metallic sodium.

The isomeric body in this oil, however, is acted upon by metallic sodium, which resinifies it, although very slowly. Thus, had this fraction been repeatedly rectified with metallic sodium, a pure hydrocarbon might at last have been obtained. The small quantity I possessed, however, would not permit of such a treatment.

It is a colorless liquid, having a peculiar, somewhat fragrant odor, and an acrid taste. With iodine it fulminates, though not by far so evidently as turpentine. A drop of concentrated sulphuric acid added to its solution in glacial acetic acid produces only a yellowish-red color.

II. FRACTION (217°–222°).

A colorless liquid, of a fragrant, lemon-like odor, miscible with alcohol in all proportions.

When subjected to analysis, the following results were obtained :

0.3071 gram of substance gave 0 8703 gram of $CO_2 = 0.2373$ C, and 0.3395 gram of $H_2O = 0.0377$ H.

Calculated for $C_{10}H_{18}O$.		Found.
C_{10}	77.92 per cent.	77.26 per cent.
H_{18}	11.69 per cent.	12.27 per cent.
O	10.39 per cent.	
	100.00 per cent.	

Exposed to a temperature of 15° it did not solidify. When saturated at this temperature for some time with dry hydrogen chloride, the oil became viscid and assumed a purplish-red color, but no crystals separated. This distinguishes it from eucalyptol,[24] which is stated to be identical with cyneol and cajeputol, and which form a mass of crystals by this treatment.

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[24] Berichte, 1884, 2941.

Two drops of concentrated hydrochloric acid added to about 15 drops of this fraction produced a yellowish color, which was increased upon heating.

Metallic sodium resinifies it. The reddish brown resin was not completely soluble in hot alcohol.

The best name that might be proposed for this body is citronellol. This name, however, has already been given by Gladstone[25] to an isomeric body, isolated by him from the oil of andropogon schœnanthus. According to Schmidt[26] the term geraniol, which would, indeed, be the proper name, has also been given to the same body. I therefore propose that the term geraniol be in all cases applied to the $C_{10}H_{18}O$ of the oil of andropogon schœnanthus, and that the term citronellol be justly retained for the $C_{10}H_{18}O$ of the oil of andropogon nardus.

III. FRACTION (222°–230°).

This fraction was collected within such a wide range of temperature because its boiling point showed no constancy within closer limits. It resembles the preceding fraction quite closely, and therefore needs no special description.

The substance was analyzed with the following results:

0.2927 gram of substance gave 0.8370 gram of $CO_2 = 0.2282$ C, and 0.3232 gram of $H_2O = 0.0359$ H.

Calculated for $C_{10}H_{18}O$.		Found.
C_{10}	77.92 per cent.	77.96 per cent.
H_{18}	11.69 per cent.	12.26 per cent.
O	10.39 per cent.	
	100.00 per cent.	

Although there is a difference of 0.7 per cent. of carbon in this and the preceding fraction, yet it appears safe to conclude that these two fractions constitute but one body, the higher fraction containing a greater amount of decomposition products richer in carbon.

ACIDS OBTAINED BY SAPONIFICATION.

The perfectly transparent alkaline solution of potassium salts separated from the admixed oil was rendered acid with dilute sulphuric acid, which caused the liquid to assume a milky appearance. Upon heating, however, it again became clear, and was distilled. The distillate A was quite acid, and oily drops floated on its surface. The distillate no longer having a strong acid reaction, the liquid in the flask was cooled, filtered, and the filtrate extracted with ether.—B.

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[25] Chem. Soc. Jour. (2), X, 7.

[26] Phar. Chem., II, 850.

A. THE VOLATILE ACID.

The acid distillate was neutralized with caustic soda, the neutral solution was evaporated and set aside to crystallize. The crystals obtained were redissolved, the filtered solution again set aside, and the crystals subsequently obtained were now collected in several portions or fractions. They were all of the same prismatic appearance, and gave the same reactions.

TESTS :

1. With ferric chloride.—A red color and a precipitate upon boiling.

2. With copper acetate.—No reaction.

3. With silver nitrate in dilute solution.—No reaction at first, but upon standing acicular crystals formed.

A larger quantity of silver salt was then prepared with a more concentrated solution of silver nitrate. The white magma which resulted was washed with cold water, and then dissolved in hot water. The solution was filtered while hot, and upon cooling a crop of long acicular crystals was obtained.

ESTIMATION OF SILVER IN THE SILVER SALT.

Some of the silver salt was dried at 100° C. until of constant weight. A weighed portion was at first gently and finally strongly heated in a crucible to oxidize all the carbon ; 0.2186 gram of silver salt gave 0.1400 gram of metallic silver.

Calculated for Ag $C_2H_3O_2$	Found.
Ag=64.6 per cent.	64.04 per cent.

B. THE ACID EXTRACTED BY ETHER.

The sodium salt of the oily drops floating on the surface of the distillate apparently remained in the mother liquid while recrystallizing the sodium acetate in fractions.

The ether, with which the filtered liquid remaining in the flask had been shaken, was mixed with some water and recovered by distillation. The aqueous liquid remaining was treated with barium carbonate. The resulting solution of barium salt was filtered, the filtrate evaporated partly on the water-bath, and finally over sulphuric acid. No crystals, but a gelatinous mass resulted. Unfortunately I lost the greater portion of this salt, and could recover scarcely enough to make a small amount of a silver salt, which was not very pure. This was analyzed, however, with the following results:

0.0555 gram of silver-salt gave 0.0300 gram of metallic silver.

Calculated for $AgC_5H_9O_2$	Found
Ag=51.67 per cent.	54.05 per cent.

Although the percentage found does not correspond closely with the theoretical percentage of silver valerianate, yet the assumption that the salt in question is a valerianate is made quite plausible, if we presume that the aldehyde contained in the oil affords the acids under consideration by a process of oxidation, and by the consideration that the combined amounts of carbon and hydrogen of the two acids correspond exactly with the amount of carbon and hydrogen contained in the aldehyde, as expressed by the following equation:

$$\underbrace{C_6H_{13}COH}_{\text{Heptoic ald.}} + O_3 = \underbrace{CH_3COOH}_{\text{Acetic acid.}} + \underbrace{C_4H_9COOH}_{\text{Valerianic acid.}}$$

It would be of much interest to submit this aldehyde and its oxidation products to further special study; but want of time has prevented me from accomplishing this at present.

As the original oil had a neutral reaction and became acid upon fractionation, it is evident that these acids do not exist in the free state in the oil, but are present as compound ethers. Here I might repeat what I have said in connection with the acids of the pennyroyal oil, that it is most probable that they exist in combination with the body determined to have the composition $C_{10}H_{18}O$.

RÉSUMÉ.

The results of the chemical investigation may be briefly summarized as follows:

I.—A heptoic aldehyde, $C_7H_{14}O$.

II.—A terpene, $C_{10}H_{16}$.

III.—A body isomeric with borneol, $C_{10}H_{18}O$, which may be designated as citronellol.

IV.—Acetic acid.

V.—Valerianic acid.

Both of the acids are probably formed by the oxidation of the aldehyde, and exist in combination with the citronellol as compound ethers.

Mr. Trimble.—I desire to say in the way of confirmation, as it may be interesting perhaps to some of the members present, that I did some work on oil of pennyroyal, and can confirm one result which I am very glad Mr. Kremers has obtained, and that is the presence of formic acid in this oil. I also obtained evidences of formic acid.

E. Painter read a paper on "Irish Moss Gelatin; Some of its Properties and Uses."

IRISH MOSS GELATIN.

BY EMLEN PAINTER.

As a member of the National Formulary Committee, it fell to my lot to investigate the emulsions, and in pursuance of this duty I made samples after all the different formulæ for emulsions that had come before us.

A mucilage of Irish moss appeared to the Committee to be the most satisfactory emulsifier for fixed oils: although it did not so minutely divide the particles of oil as some of the other agents, it made a more uniform and permanent emulsion in the hands of different manipulators than any other agent tried, and it was finally adopted by a unanimous vote of those present.

The chairman of the Committee suggested that it would be very desirable if this mucilage could be preserved or more readily prepared than by the somewhat tedious and roundabout method in use. To this end I made a few experiments. Alcohol being satisfactorily employed to preserve the emulsion, it occurred to me that the mucilage might possibly be preserved indefinitely in the same way, and thus kept ready for use whenever desired. Upon trial, however, I discovered that when the quantity of alcohol used in the formula for emulsions was added to the mucilage first, the emulsifying property of the mucilage was very materially lessened, and in fact it was rendered totally unfit for the purpose.

I next took a quantity of mucilage of Irish moss as prepared for making the emulsion, and evaporated it in a water-bath to a thick syrupy or semi-fluid consistence, and with a small brush spread it upon plates of glass to dry. In the absence of a drying-closet, these plates of glass were placed over gas stoves, elevated a foot or more above the flame, and with a sheet of wire gauze intervening. In a short period of time the mucilage, or rather gelatin, as it may more appropriately be named in its changed form, became hard and dry, and began to peel off the plates in the hottest places in thin wafer-like scales, as shown in the samples here before you.

The yield of gelatin from the Irish moss used (which however was not completely exhausted by my mode of manipulation), I found to be about 70 per cent. In the mucilage for emulsions, made in the same way, 60 grains of moss was used in making 5 ounces of mucilage, this quantity being required to make one pint of a 50 per cent. emulsion of oil. Therefore, 40 grains of the Irish moss gelatin practically represents the quantity required to make a pint of emulsion of oil.

Whilst this gelatin is but slowly and sparingly soluble in cold water, it dissolves completely in hot water, and a mucilage may in this way be prepared in a comparatively short time.

The following formula was proposed for

EMULSION OF COD LIVER OIL.

Irish moss gelatin	40	grains.
Boiling water	5	fluidounces.
Cod liver oil.	8	“
Syrup tolu.	2	“
Alcohol	1	“
Oil sassafras.	10	minims.
Oil wintergreen	10	“
Oil bitter almond	2	“

Dissolve the gelatin in the boiling water, taking pains to have it completely in solution; transfer the mucilage formed to a pint bottle; gradually add the oil in divided portions; shake the bottle vigorously after each addition, and until a perfect emulsion is formed, then incorporate the syrup, and lastly add the alcohol in which the essential oils have previously been dissolved, and shake well together.

If preferred, this emulsion may also be made in a mortar in the usual way, and it is probaby better to let the mucilage become perfectly cold before ,proceeding further with the emulsion. A sample made after the above formula is here presented.

Irish moss gelatin may be readily prepared in a small way by the following method:

Take of good bleached Irish moss a convenient quantity, wash it well with cold water, and place it in a boiling water-bath with about fifty times as much hot water, stir frequently and continue the heat for about fifteen minutes, then transfer the mixture to a strong muslin strainer of open texture, and with moderate pressure strain off the mucilaginous liquid. To obtain a larger yield the undissolved portion may be returned to the water-bath, and treated a second time with about one-third the quantity of water, and strained as above. The strained liquid is then evaporated in the water-bath to a proper consistence in the manner before described, and spread upon plates of glass to dry.

The gelatin prepared as above is designed only for emulsions or other opaque mixtures. Irish moss mucilage, however, is admirably adapted for other pharmaceutical uses.

If a perfectly clear mucilage is desired, the solution of Irish moss must be filtered through paper before evaporation. This may be readily accomplished by first diluting the mucilaginous liquid before described with two or three times its volume of water; and the filtration will be greatly accelerated by loosely filling the plaited paper filter with absorbent cotton before pouring in the liquid.

Some further experiments were made with the view of producing Irish moss gelatin by a process adapted to a more extended scale of operation, entailing less labor, and with the endeavor to furnish an article suitable for any purpose for which the gelatin is useful.

I made use of a percolator which I had previously constructed for making syrup of coffee. It consists of a cylindrical metallic percolator, 18 inches high, tapering slightly, and from 4 to 6 inches in diameter. This percolator is surrounded by a water-jacket, as shown in the accompanying cut. The lower extremity of the percolator terminates in a tube ⅜ in. in diameter, which is bent at right angles, and passes through the side of the water-jacket, the tube terminating in a ⅜ in. bibb. I had made of cheese-cloth a long, conical shaped bag of about one half the capacity of the percolator. This bag was filled with selected Irish moss (holding ½ lb.) which had been previously washed in cold water. The bag was then suspended in the percolator, the water-jacket and percolator both filled with water, and the apparatus placed over the fire. After being kept at the boiling temperature for about two hours the bibb was opened and a perfectly clear mucilaginous liquid drawn off, which, upon evaporation and spreading upon plates of glass as before described, yielded a beautiful transparent gelatin. This gelatin, when dissolved in hot water, makes a perfectly clear mucilage, which I have the pleasure to here exhibit.

The Irish moss will not be nearly exhausted by this one operation, but the percolator can be repeatedly filled, heated and drawn off as before, until nearly all the soluble portion is obtained.

The water-bath is not absolutely necessary in making the mucilage in this way, though I found it to make a nicer product than without it—using the same strainer cloth. If a thicker strainer was used it would possibly make as clear a solution without as with the water-bath.

For convenience, and a saving of much labor, the mucilage may be drawn directly into shallow trays, and these placed in a well-heated drying closet, or by other suitable means evaporated to dryness. Thicker sheets of gelatin are obtained by this method, which answer every practical purpose; a little longer time only is needed to dissolve them.

New York, *August* 1887.

Mr. Painter.—The mucilage cannot be very well kept prepared, and cannot be preserved with alcohol, but must be made fresh. That is the object of preparing the gelatin. It has been passed upon by the Committee to be one of the articles of the new Formulary, and at the suggestion of Dr. Rice, I prepared the paper to publish in the new Formulary which will include this article. The gelatin can be very well preserved. The mucilage may be preserved by some antiseptic; but if preserved with alcohol its use as an emulsifier is spoiled. Alcohol is necessary to keep an Irish moss emulsion. Many of those which are on the market as proprietary articles are Irish moss emulsions. That is where the idea came from. One of the Formulary Committee made a careful analysis of the emulsions, and it was at his suggestion that this mucilage was used. Some of the emulsions of oil containing alcohol did separate much. This does not separate a great deal. Many of those which spoiled did not contain alcohol.

MR. FINLAY.—When using salts, like the hypophosphites, I find them to cause separation.

MR. PAINTER.—A satisfactory emulsion may be made by first dissolving the salts in mucilage, and then proceeding as you would without the salts, though the oil does not emulsify quite so rapidly.

A paper by Mr. Lloyd, entitled "Pharmacist and Manufacturer," was read.

PHARMACIST AND MANUFACTURER.

BY J. U. LLOYD.

At the meeting of the Ohio Pharmaceutical Association, Mr. L. C. Hopp introduced a resolution in support of a class of pharmaceutical preparations to be made from plants, upon the principle used in making fluid extracts and tinctures, but to represent only 50 per cent. of the drug.

It would be out of place now to argue for or against that motion; suffice it to say that, owing to neglect of business on my part, and absence from that session, I missed the opportunity to obtain the views of the talented members who expressed themselves regarding the subject. My excuse now for bringing the matter before our Association is to review a phase of the argument that was presented at that time, and which I have long studied, and more than once intended to venture an opinion upon.

During the argument, Mr. Hopp, in substance, remarked that manufacturers of pharmaceutical preparations on a large scale thought that they could better produce—or they lead pharmacists to that impression—fluid extracts representing the drugs, pound to pint, than pharmacists with ordinary appliances. This phase of the argument was debated at our meeting.

In considering it, I must announce at the outset that my sphere of labor, perhaps, is not of such magnitude as to make me an authority, and that this paper is written both to gain information and to record my experience, which, in a small way, covers much ground in species of plants worked, and also, in many instances, in the preparation of moderately large quantities.

I exclude the profit and loss side of this question. The query is manipulation—the advantage one has over the other in the quality of the product.

It must be borne in mind that this is not the consideration of some substance that is involved by long-continued investigations of a semi-proprietary nature; it is not a comparison of something obtained on a large scale and originated outside of legitimate pharmacy, and which the pharmacist designs to imitate; and it is not an obscure material, the working process being unknown. It is, upon the contrary, a simple product designed to be readily prepared by ordinary pharmacists, with usual appliances, and if any imitation is necessary, it must be from those who vary from the standard and deviate from the officinal preparations. Then the question is, What real advantage has the trade worker over the pharmacist?

1. The quality of material is of primary importance. In procuring such of prime condition, has the large operator any advantage? That he may obtain more or less of exceptionally nice specimens of drugs is evident, but can he as easily procure a large uniform quantity, all of prime drugs? Is is not probable that considerable unevenness must exist in many instances? I doubt if our wholesale druggists are often so placed that they cannot supply their patrons with a pound or a moderate amount, choice, of almost any drug, for selections are easily made in a small way. I doubt also if large operators, as a rule, do not experience more or less trouble in obtaining their supplies, and the question arises, Which has the advantage over the other? I am now convinced that the pharmacist can usually obtain drugs of first quality, if so desired, in amount sufficient for his requirements, and that the manufacturer on an average can do no better.

2. *Improved Apparatus.*—More or less is heard about the advantages enjoyed by manufacturers by reason of improved and complex apparatus. We should not forget that the object is to produce a counterpart of a preparation that is easily made with ordinary apparatus in quantities of about one pint, according to the recognized authority. If the manufacturer improve his apparatus it must be to overcome some disadvantage he labors under, or to give him a pecuniary benefit. If he produces either a stronger or a weaker preparation than is yielded by the U. S. P. amount by means of alterations in method, the question arises, Is the substance labeled true to name if it is thrown upon the market under the officinal appellation of fluid extract? Is not such improved apparatus, if it exist, designed for the simple purpose of enabling the operator on a large scale to imitate a product that is standardized on a small scale? Remember, I exclude economy; the question is product. My view of the matter is that pharmacists with ordinary opportunities can as easily increase the strength of a fluid extract beyond the standard as the manufacturer, but that such course is reprehensible. If manufacturers employ apparatus that yield a product different from the officinal, they too are subject to criticism. In my opinion, simple percolation is as yet unexcelled, and my experience with complex forms of apparatus has invariably led to their rejection and a return to the simple percolator.

3. Experience and skill is necessary in both cases. The large operator has quantity advantage, but this with changing proportions really is a problem to study. Besides, magnitude of manipulation is not a criterion of excellence. It is surprising to note how little some of us really know about the true inwardness of subjects by which we are actually enveloped. Who will deny that workmen may be surrounded by tons of material, and still be ignorant of the properties of such substances beyond what they learn from outward sources? Admit that each is equally skilled, the one in working small amounts, the other in quantities, and we have not solved the problem. The large operator is a manager, the small operator the workman. The large operator must trust his employees to moisten, handle, pack, and often percolate and finish. The pharmacist may with his own hands begin and end the operation, and instead of simply overseeing the process, he really is the pharmacist that makes the preparation. The large operator's percolators are opaque and he works in darkness; the small pharmacist uses glass and can observe the operation as it progresses. It is sometimes advanced as an argument that pharmacists often have imperfect pharmaceutical education; cannot it be said that manufacturers are sometimes entirely dependent upon employees, and do not even make a personal pretension to pharmaceutical education? I have heard it advanced that pharmacists neglect their business when they make preparations, and are too much interrupted to prepare these simple pharmacals; upon the other hand, it may perhaps be said that, if personal attention to manipulation is necessary, many manufacturers whose names appear on their labels have reason to pass that feature of the argument.

My experience teaches that both skilled and unskilled labor is to be found in each direction. I would not attempt to draw a distinction. Some manufacturers are accomplished, careful pharmacists. Admit as much, and who will assert that the equal to any manufacturer is not to be found among pharmacists? That some who conduct pharmacies are not at all pharmacists is indisputable, but who will advance as an argument that manufacturers have an advantage in this direction? The names over the doors of each pharmacy and factory are sometimes liable to mislead—in the one case, an unnamed clerk being the real pharmacist; in the other case, an unknown workman being the real manufacturer. In both instances, the name on a label is a misnomer.

If I should venture an opinion, I would say the average pharmacist is as skilled as the average trade manufacturer. We have examples of the highest integrity and of superior excellence in both directions. I doubt, however, if any manufacturer of pharmaceuticals of my personal acquaintance would thoughtfully sanction the "I am better than thou" argument as a commendation of his wares.

4.—Admitting for the sake of argument that both the large and small worker stand on an even footing regarding the foregoing phases of the subject, and we come to the real comparisons of working quantities. Large operators work from 100 to 1000 pounds of the drug at a time. In doing so they have the benefit of the increase of contact that may be obtained from depth of both material and menstruum. However, it is now, in my opinion, a question as to whether this advantage is not more than counteracted by the fact that in a great many instances it is impossible to properly percolate such large masses if the material is in fine powder, and, in consequence, the operator on a large scale is induced to employ the drug in a very much coarser condition than would be employed by pharmacists. Such coarsely-ground drugs are really mixtures of various degrees of fineness, and this places him at a decided disadvantage, and introduces an element of uncertainty regarding the actual condition of the drug under manipulation. All who are familiar with operations of this character will, I think, agree that such unevenly-ground drugs are inclined to be extracted without much regularity as regards comparisons between the different degrees of fineness. This is evident, but there is one important factor to prevent such being accomplished that I do not remember to have ever heard mentioned, and possibly it has been overlooked by others. I refer to the fact that according to my experience the fine powder under these conditions is extracted *but little, if any, faster* than the coarse, and scarcely less thoroughly, and that the drug might about as well all be coarse as partly coarse. The explanation is simple when we think that the menstruum pervades all parts of the mass, and whatever may be its condition, saturates all parts of the material. Thus, instead of depleting the fine particles and then gradually attacking the coarser, it carries extractive matter from the coarse to the fine long after the fine would have been exhausted, had there been no coarse material present. In other words, a uniform menstruum maintains a uniform rate of extraction. and the fine powder cannot be depleted faster than the coarse. I am of the opinion that the pharmacist in pharmacopœial quantities is not at a disadvantage.

5. Admit, however, that the conditions are identical as regards the powdered drug, and we come to the moistening of the drug. All agree that in order to insure uniformity of extraction we must have a uniformly moistened powder—that is, it must not be unevenly dampened. In a small way this moistening is readily accomplished by admixture in an evaporating basin or a large mortar. Upon the contrary, in a large way, either specially contrived apparatus is necessary or much manual labor is required. At the best, it is a question as to whether any will argue that the large operator has the advantage. I do not know of any.

6. After the powder is moistened, it must be evenly pressed into the percolator. If it is firm in any section and loose in another, uneven percolation results. Is it easier to pack a large than a small percolator

and obtain a uniform pressure upon the powder operated upon? This I doubt. Upon the contrary, I can more satisfactorily obtain an even pressure with small, narrow percolators than with large ones. I do not think the operator has an advantage over the pharmacist in this direction.

7. However, admit for the sake of argument that both a one-pound and a thousand-pound batch of material is in the condition of a fine powder, and that both are so moistened and packed as to percolate readily. The contact between the menstruum and powder, under precisely similar conditions, appears to be very much in favor of the larger quantity, but is it really so in practice? In order to produce such advantage would it be necessary that both should percolate with the same rapidity? If it requires 24 hours to obtain a pint of percolate from 1 pound of material, should it require 24,000 hours with the thousand-pound batch, or should 1000 pints of percolate be obtained in 24 hours? I do not propose to argue in favor of attempting to extract 1000 pounds of material in one day. Neither do I hesitate to say that there is not, in my opinion, a manufacturer in America with facilities or patience sufficient to permit him to consume three years of time with a single percolate. Therefore, I accept that in large quantities manufacturers agree to increase the flow sufficiently to obtain the percolate in a reasonable length of time. Now the question arises, does this increase of rapidity of percolation counterbalance the increase of contact gained by the respective heights of both menstruum and drug that the large batch occupies? In my opinion, the advantage in contact is counterbalanced by increased rapidity of percolation where large amounts are employed. I would not hesitate to attempt to conduct the operation of percolation with one pound of the properly prepared powder, in confidence that the result would be as satisfactory as where I use 1000 pounds.

8. Evaporation of the second part of the percolate is necessary in either case. As the amount of liquid increases by ordinary methods of evaporation, the large operator has to contend with a more continued application of heat, out of proportion to that employed by the pharmacist on a small scale.* Perhaps the advantages of vacuum or other methods said to be enjoyed by some manufacturers will counterbalance the disadvantages they labor under in the direction I have named, but we have no direct figures to base our remarks upon. As I now look at the matter, the heat employed in the majority of cases wherein the officinal percolate is evaporated is not sufficient to injure the product. If trade operators are forced to devise special forms of apparatus, it is because of the disadvantage they labor under and to meet the pharmacopœial methods.

To sum up, I am convinced that pharmacists can prepare fluid extracts, of the present officinal strength, without difficulty and of standard

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* See Am. Pharm. Proceedings, 1886.

quality. The manufacturer on a large scale, in my opinion, labors under disadvantages that are more than sufficient to counteract his advantages. Speaking for myself, I will say one of the problems I have to contend with on a large scale is that of a positive knowledge of the product, as compared with a standard made in small amount. Also, I have the uncertainties of manual labor, and the darkness of opaque percolators, and it seems probable that others are also encompassed with these perplexities. I do not hesitate to say, if the manufacturer can produce fluid extracts of pharmacopœial strength, the pharmacist will have little trouble in doing so. Care, attention, experience, education, are required to produce standard fluid extracts in small amount, and, in addition, manufacturers have aggravations that are unknown to pharmacists.

That hundreds and perhaps thousands of persons who conduct apothecary stores will always purchase such simple preparations as fluid extracts is undeniable. That in many instances those of excellent pharmaceutical attainments and high standing will do so is probable. Circumstances seem often to necessitate such dependence on the trade maker, and I do not deny that forcible arguments can often be advanced in favor of qualified men purchasing instead of making. However, I, for one, am not willing to admit that those courtesies, when extended manufacturers, are in consequence of inferiority of the pharmaceutical profession. My study of this subject leads to the opinion that trade makers of pharmaceuticals neither can nor do make better fluid extracts than the careful pharmacist. If our pharmacists find it to their interest to purchase instead of manipulate, manufacturers should, and I believe as a class do, appreciate the courtesy. It is a graceful compliment that these gentlemen extend by saying, "We have confidence that your products are equal to those we prepare ourselves," and should be so considered. Let us look at this matter in its proper light. Consider the fact—for fact it is—that the *standard* is made by pharmacists to conform to a product that can be easily made in small quantities by ordinary pharmacists. Let us not strike a blow at professional attainments by encouraging those who are interested in obtaining pharmaceutical educations in believing that they cannot in pharmacopœial amounts produce reliable pharmacopœial preparations. Let us not by any means in so simple a class of preparations as the fluid extracts permit such an opinion to become rooted in the minds of our young men. Perhaps in this matter I will stand nearly alone. I have reason to believe that many of my friends, both manufacturers and pharmacists, will differ with me. However, my opinions result from as careful a study of both sides of the question as I have been able to make with my opportunities, and I conclude that in officinal preparations manufacturers should aim to produce preparations that are only equal to those of the pharmacopœial standard. It seems as I now view the subject that from the *quality* stand it is a little presumptuous for manufacturers to say "We make better preparations than you can," when the fact is all that they can pretend to do and conform to authorized standards is to *equal* the officinal preparations.

In thus considering this subject I have endeavored to present the several phases as I have been confronted with them and as I present them to my classes. It strikes me that an impression that has been firmly engrafted in the minds of pharmacists should not be permitted to pass unchallenged without thoughtful consideration regarding the foundation of the assertions. The professional character of the pharmacist suffers enough, to make the best of it, and we should call a halt when questions arise as to our capacity for making good medicines of the simplest character. Take from us the privilege of making fluid extracts, tinctures, ointments, cerates, plasters, and such substances, and we are undermined. That we are to an extent responsible for the present general opinion is evident, but we must not become pharmacists by name only. The appellation "Hamlet with Hamlet left out," is not pleasant to contemplate.

Mr. Cushman.—I am of the opinion that the same Creator, who has placed his wisdom in the brains and heads of every one, has given no superior advantage to the large manufacturer. I have held conversations with drug powderers, those who advertise to furnish drugs properly comminuted for percolation, and have asked the question: Have you been particular in cleansing your mill after powdering a certain drug? and they said, No. Suppose that ipecac has been powdered for percolation and then some other drug has been run through the mill. You get perhaps one ounce of ipecac mixed with a pound of the other drug. I have found that to be the case. My opinion is that every pharmacist should make his own preparations, particularly his own galenical preparations. I prepare all fluid extracts and a great many solid extracts. To a pharmacist there is no galenical preparation but what he can make. He has the National Dispensatory, and the United States Pharmacopœia, which is his vade mecum; if he has the skill he has the right to manufacture. A manufacturer has no right to know anything that a retail pharmacist has not a right to know. I think it is the duty of every pharmacist to make his own preparations. A remark was made to me in a group of physicians when I spoke of adulterations, that it did not make any difference where the druggist procured his stock so that he procured it from a responsible house. I made visits to different drug stores and found on the shelves several drugs that were adulterated: one druggist had been selling for ten years coal dust for black antimony. I asked where they got those, and the reply was, from responsible houses, from manufacturers. Now, in order to overcome this I have obtained the necessary implements for manufacturing my own preparations, and I do not consider the expense. A druggist should not consider the question of a fluid extract being ten cents a pound cheaper, to be of so much consequence as to buy it from the manufacturer. The large manufacturing establishments often make extracts in a crude manner. There are exceptions, but you would be surprised if you were to analyze the materials, particularly those comminuted for making an extract. How careless some of them are! I think it is the duty, if the pharmacist has the skill, to make his preparations; and he ought to have the skill to make any of the preparations laid down in the Pharmacopœia.

Mr. Menninger.—Mr. Cushman is rash on the retail dealers. I think he failed to establish how he ascertained it. The quality of the drug sometimes depends on its freshness, and sometimes things may be wrongly labeled. Now this coal dust, sold in place of black antimony, that may have been a humanitarian deed by the proprietor of the establishment; but I think the therapeutic effect of the coal dust applied to the horse is superior to that of the black antimony.

MR. PRESCOTT.—I desire very heartily to endorse and add my personal approval to the principal conclusions of Prof. Lloyd in regard to the benefits to the pharmacists in preparing their own galenicals. Of course, in discussing this matter with dispensing pharmacists the difficulty most likely encountered is that the keeping of any stock and of a good assortment of drugs is quite expensive. It is a difficulty to be overcome, but most pharmacists are not in the habit of doing it. I would urge upon pharmacists the consideration how great a benefit and how many benefits he will derive by keeping such an assortment, and by making not only fluid extracts, but all other galenical preparations that are required from time to time in a smaller or larger quantity. You know it has become a custom, which in most cases is honored more in the breach than in the observance, to make tinctures from fluid extracts, so that the fluid extract becomes the source of the other galenicals, and the fluid extract is obtained from the manufacturer. Now we know it is not uncommon for physicians to lose confidence in fluid-extract manufacturers in large works to such an extent that they resort to tinctures instead. They write a prescription for a tincture instead of a fluid extract, because they see that the pharmacist will make his own tinctures, and that he does not make his own fluid extracts, and in many cases the assumption we know is based upon the fact; and yet there are pharmacists who do not make the tincture in any other way than to dilute the manufacturers' fluid extract. The greatest disadvantage that the pharmacists really have in comparison with the manufacturer in making the galenical preparations, like fluid extracts, is the one named by Professor Lloyd, the obtaining of the powder. We must confess that on the score of cheapness, in the adoption of mechanical appliances, the manufacturer does have the advantage. The grinder on a large scale ought to have the advantage over the pharmacist working on a small scale. Here again we are met with that great uncertainty as to the thorough trustworthiness and care of the grinder and his employee, so that we must still say that it is desirable for the pharmacist not only to keep in stock a good assortment of fluid extracts of his own make; but it is desirable that he should powder his own drugs, unless he will himself take pains to examine, with the microscope and otherwise, the powders, to detect deterioration and ascertain that no admixture has taken place.

MR. EBERT.—The reading of Mr. Lloyd's paper has brought to my mind the following query: What is the cause of so large a number of firms engaged in the manufacture of the officinal galenical preparations of the Pharmacopœia which properly belong to the domain of the dispensing pharmacist? To the recollection of many of us this present state of affairs did not formerly exist. I claim that the origin of this innovation in the art of pharmacy is largely due to the class of preparations called "fluid extracts," and which class was so greatly extended in the last revision of the U. S. Pharmacopœia. The next query that presents itself to me is whether there is a necessity of such a class of officinal preparations, and I unhesitatingly reply no. and predict that if this class of preparations be wiped out at the next revision of the U. S. P., it will leave 50 per cent. of the present number of the manufacturers of galenical preparations without a vocation. I would recommend that instead of the present fluid extracts a class of tinctures be introduced which contain 50 per cent. of the drug; this will do away with application of heat for concentration and the present loss of an expensive menstruum—thereby producing a better preparation at a much reduced cost, and the process of such a character that it can be carried out in the store of any pharmacist in the land. The manufacturers claim that they have advantages in apparatus, machinery, etc., laying great stress upon the large quantities that they operate upon at a time, their mode of evaporation in vacuum pans, and the quality of the crude drug that they have the facility to purchase in the market in large quantities: these are all fallacious claims, which I disclaim to be so from personal experience. In reference to quality of crude drugs, only a few weeks ago I had an interview with one of the largest dealers in crude drugs, and he assured me that it was a very difficult matter to obtain very large quantities of crude drugs frequently, and therefore it became a necessity to use what the market presented to fill orders. Now in the matter of exhausting the drug by means of percolation, I can testify to the statement made by the author in his paper, that a quantity of a pound or two is much more properly exhausted than that of 1000 to 2000 pounds at an operation. I have made this test hundreds of times in the manufacture of glucose, where the experiments were first performed on pounds in the laboratory and afterwards carried out on the scale of tons. The matter of evaporation is also one of the particular boasts of the manufacturer when he extols the quality of his fluid extract, "We use vacuum pans and thus prevent injury by the application of heat." In answer to this I will say that less injury is done by the direct application of heat to one pound than by the use of a vacuum pan for the evaporation of a thousand pounds.

However, I think the remedy to the whole subject under consideration is that the next revision of the U. S. Pharmacopœia be entrusted to the dispensing pharmacist, and not be gotten up in the interest of the manufacturing pharmacist.

We are much to blame for the existing state of things: the men who did the revising were the Professors of Colleges of Pharmacy, physicians and representatives of manufacturers. What we want is a Pharmacopœia whose processes are of such a character that they can be performed by every intelligent pharmacist in the land. The changes that were made in the last revision are not of this character, and I charge that it looks as though the last revision was gotten up more in the interest of the manufacturer than that of the dispensing pharmacist. The result which has thus far been observed has impressed this fact upon us; therefore let us not lose sight of this important feature, that the next revision be in the interest of the profession of Pharmacy and its dispensers, and not in the interest of manufacturers.

Mr. Menninger.—While I fully agree with my friend Mr. Ebert, that many of the fluid extracts are superfluous, yet I cannot agree with his sweeping assertion that we could dispense with them all. The bulk of the medicine is very frequently important. I have known instances, notably in the use of ergot in cases of parturition, the patient being in an almost comatose condition, when the quantity, the bulk of the medicine, is of great importance. It is common now prior to parturition and after it, in order to ensure the proper contraction of the uterus, to use deodorized tincture of opium and fluid extract of ergot in equal quantities. I can imagine that increasing the bulk fifty per cent. in such a preparation would be a great disadvantage. I desire to call attention only to that one point.

Mr. Remington.—I did not expect to say a word on this subject, for I think that Prof. Lloyd has certainly covered the whole ground of this subject; but the discussion has taken a very wide range, and certain charges have been made here that I feel it my duty to refute. In looking over this paper, I think it must be admitted by all that Prof. Lloyd, in view of the fact that he is a manufacturer of pharmaceutical preparations, has treated it in a very broad and fair light. The statement has been made by Mr. Ebert, that the Pharmacopœial formulas have been constructed, and the Pharmacopœial preparations have been adopted, in the interest of manufacturers. As a member of the Committee on the revision of the U. S. Pharmacopœia, I positively and flatly deny the correctness of that statement, and I challenge Mr. Ebert to produce a single illustration where that is the case. The pharmaceutical members of the Pharmacopœial Committee were mostly practical pharmacists, and they were the proper men to elaborate the preparations. Upon the pharmacist rests the responsibility of making his preparations; he should be held responsible by the physicians and by the public. When you buy a preparation from the manufacturer, you have nothing whatever to depend upon but the reputation attached to the gentleman's name. You do not see the drug from which the preparation is prepared. You do not see the detail which is pursued in the course of manufacture. You must take his *ipse dixit* on the label for the quality of that preparation. You assay that remedy if you choose; but can you find out that a fluid extract is as represented? To which I answer that there are some drugs that cannot as yet be assayed, while of others their strength can be ascertained, but the great majority of the pharmaceutical preparations, including fluid extracts, cannot be assayed with any reasonable accuracy so as to prove that they represent a given amount of the drug. Now, gentlemen, I think you would all agree that the proper argument was in favor of the pharmacist making his own preparations. So he should. The advantages are plain. In the first place, the pharmacist sees the drug, and upon his judgment depends the question whether the preparation will be of the required strength. The physician should be able to go into the pharmacy, and putting his hand upon the man, say, " Upon you, I place the responsibility of this want of effect." The pharmacist may say, " Well, I used So-and-so's fluid extract, and they are a good firm." " No," the physician should say, " you have no business to use that man's fluid extract until you have proved it to be good. You should have made your own preparation. I hold you responsible." Until that is done by the physicians, we will not have the best class of preparations. (Applause.) Now, a good many pharmacists make their tinctures from fluid extracts. I do not believe that this is done by many thoroughly educated pharmacists. I am very well aware that manufacturers have succeeded in capturing many druggists throughout the country by means of their books, specifying their own fluid extracts for making tinctures. As Professor Prescott says, many pharmacists do it, and we must all admit that many do pursue that habit.

THE CHAIRMAN.—At the last examination of the Virginia Board of Pharmacy I showed the applicants specimens of different roots, barks and other drugs, and found very few of them had ever seen them in that condition; they had seen them in a powdered condition, and said that the drugs were not kept in the stores where they were employed, and that the tinctures were made from fluid extracts, showing that it is a very common practice in the smaller towns and rural districts.

MR. REMINGTON.—I admit that, and I think any one must admit it.

MR. PRESCOTT.—I wish we could have some testimony on the other side, and would be glad to have just as much of it as can be gathered from those present.

MR. PAINTER.—The pharmacists of New York do not all make their tinctures from fluid extracts: I think it is rather the exception than the rule. A great many whom I know personally, and I think the large majority doing business in New York city, do not make their tinctures from fluid extracts.

MR. REMINGTON.—That is the point I wish to get out. I believe in those rural districts, where there is very little pharmaceutical education, as a matter of convenience, and simply because sufficient knowledge is not possessed by the druggists, that this practice prevails; but in all large cities and amongst most of the educated pharmacists of this country, it is a matter of scorn to make tinctures from fluid extracts. I happen to know this, because I come in contact with many young men from different sections of the country, and I heard it frequently said, "I do not want to learn my business with that man, for I will never get an opportunity of making a fluid extract from the crude drug. He makes all his tinctures from fluid extracts." It is a matter of disrepute among the young men who wish to be educated in their profession. Why? Because such an employer gives the young men no opportunity of practically acquiring a knowledge of the business, and every one must, according to our requirements in the College of Pharmacy, possess four years' experience in the drug business. I am sorry to see a young man coming from an establishment where he never gets a chance to make a tincture. If this is the case, what is to become of the professional standing of pharmacists in this country? Any man can be a pharmacist so-called; any one who can take the cash, and even a boy, if he knows enough to make the change, he can be such a druggist. All he has to do in making preparations is to take the fluid extract and add it to water or alcohol.

Mr. Ebert.—Will the Professor allow me one word? Suppose there were no fluid extracts officinal, how would that be overcome?

Mr. Remington.—The manufacturer would still have the fluid extracts, and it would suit the manufacturer perfectly to be allowed to supply them. If Mr. Ebert will show me a fluid extract in the Pharmacopœia, the formula for which is not practical, or if he will show me why any pharmacist of ordinary intelligence cannot make these pharmacopœial preparations easily and readily, then I will acknowledge that the preparations of the Pharmacopœia have been made in the interests of the manufacturers.

Mr. Rogers.—I wish to say a few words in behalf of the druggists outside of the largest cities. I do not wish the impression to prevail, or to be accepted as such, that the good faith or intelligence in regard to pharmacy is all confined to the largest cities. I know of no druggists recognized as being in good standing in the community who prepare their tinctures from fluid extracts. I know of many who prepare their fluid extracts directly from the drug, and who make all their preparations by the officinal formulæ.

Mr. Whelpley.—Mr. Ebert should have the opportunity of answering the direct question of Mr. Remington. I do not coincide with Mr. Ebert, but I believe he has a right to answer the question.

Mr. Ebert.—There never has been a time in the history of American pharmacy when there has been less manufacturing done by the pharmacists than at the present time, since the revision of 1880. Mr. Remington says here, there is not a formula in the Pharmacopœia but what is easily to be understood by the pharmacist. Now I say that the formulas are not so clear as they ought to be; but that feature does not make the pharmacists think the Pharmacopœia very inviting, when they cannot use it to make any preparation without having the National Dispensatory, the United States Dispensatory, Remington's Pharmacy, or somebody else's book. It is very difficult to manufacture with the apparatus in the hands of the ordinary pharmacists of this country. If you will look at the names of the gentlemen who were the revisers of the last Pharmacopœia, you will be surprised to find how very few actually practical pharmacists were on that committee.

Mr. Hallberg.—Three years ago Professor Wall, of St. Louis, presented a paper at the meeting of the Association in Milwaukee upon this very subject, and there was little if any discussion. Since then Mr. Wall has been a most prominent advocate in this country in showing to druggists generally the great advantage of making tinctures and all galenicals from fluid extracts; the chief point he makes is, and this is the point that

I want to bring out, that a fluid extract properly prepared and kept will remain in a better condition than any crude drug will; that given a good crude drug a fluid extract can be made which he claims to be adapted for making any galenical, because the amount of the active principle of the drug represented in the preparation will be in better proportion and act better than if reliance was placed solely upon an average crude drug, which would be liable to become worm-eaten and to deteriorate. I never took that view, which I think is radically wrong. I think the deterioration is greater in the fluid extract than in the drug.

MR. LYONS.—I think the thanks of the Association are due to the extremely fair manner in which the subject of the paper has been presented by its author. The discussion has been mostly on quite a different subject. Whether the manufacturer can come before the public and claim that he is in a better condition to supply the wants of pharmacists than the pharmacists themselves, has been the question taken up, and it seems to me that from the standpoint of one interested in manufacturing, the only fault we can find with the paper is that in some particulars the advantages of the manufacturer have not been fully stated. The points made by Mr. Hallberg and by Professor Prescott are well taken, and are in the interest of the manufacturer rather than the pharmacist.

A vote of thanks was, on motion of Mr. Painter, extended to the author of the paper.

Mr. Painter read a paper entitled "The Medicines of Medicine."

THE MEDICINES OF MEDICINE.*

BY EMLEN PAINTER, PH.G.

The object of the article is to throw some light, if possible, upon one of the most important adjuncts to the healing art—the medicines prescribed by the doctors of medicine—not to abuse, however, in any degree the confidence of the medical practitioner reposed in the pharmacist, nor to criticise the prescriptions of any physician.

I desire only to review the subject from a professional and scientific standpoint, to advance a progressive theory, and to point out, if possible, the quagmires yawning in every direction to entrap the unwary. For obvious reasons the pharmacist has a superior point of observation from which to view this subject, otherwise I would hesitate to put forward my views and criticisms on a matter so important to medicine.

From a review of prescriptions of leading medical men in different localities for a period of 20 years and more, it is an observable fact that in proportion as scientific research has eliminated the different distinct principles of drugs employed in medicine, so have their separate principles grown more and more in use, and the drug itself and galenical preparations of the crude drug are less and less prescribed. It does not require a prophet to foretell that it is but a question of time when the

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*This article was written with the intention of contributing it to a medical journal, but I have since decided to first bring the matter before the pharmacists of the country, and I now have the honor to present the paper to this representative body.

separate and definite principles only will be employed, and that the inert, objectionable, vague and varying substances will be discarded. It is also my conviction that eventually, through developments in scientific research, all remedial agents (other than food products) will be presented in their simplest form, and that preparations of crude drugs and mixtures, as primary articles of medicine, will become obsolete. I look upon any obstacle in the way of development in this direction as a serious drawback to medical and pharmaceutical knowledge, and a still greater detriment to suffering humanity.

As evolution proceeds in this course, the more learned and skillful of the medical fraternity will make their selection from the simples to suit the individual case under treatment, like the true marksman who singles out his game and with unerring aim brings it down. There will then follow all grades, down to the medical man who prescribes by culling over old prescriptions, or, if the ready-made prescriptions which now flood the market are not then extinct, he may prescribe one of these (concocted possibly by a wholesale drug firm or a grocer) as, with an old-fashioned blunderbuss, he fires at the flock.

In this evolution above referred to, the pharmacist must also take an active part. Those in the vanguard, with the aid of the chemist, will devote themselves assiduously to separating the chaff from the grain; they will provide the means to enable the prescriber to make his selection of simples for whatsoever form of administration desired. And from this class of pharmacists, as of physicians, all grades will be found, down to the dispenser who will send away a legitimate prescription because of the lack of knowledge, or facilities for dispensing it, and who would be willing to content himself with handing out, or counting out, factory-made prescriptions, or the selling of other cure-all nostrums.

Although this great work of resolving remedial agents into their separate principles possessing distinct or different physiological properties goes on, and untold advantages to medicine and pharmacy are accruing from it, yet the benefits are lessened and the work seriously retarded; medicine and pharmacy are demoralized and besides saddled with a stupendous burden by the manipulators of these remedies, who force their mixtures upon us as primary medicinal agents.

The magnitude of this abuse, the absurdity of it and its demoralizing effect, can perhaps be better shown by first reciting a few brief statistics.

There are in the United States not less than 160 different so-called "manufacturers of pharmaceutical preparations," who in reality, for the most part, are but mere manipulators and mixers of drugs. At least 25 per cent. of this number have offices in New York, and a still larger percentage send out their drummers to the medical men in this vicinity to distribute samples, to extol their wares, and to urge the physician to designate their particular "make" in prescribing.

These 40 odd manufacturers include in their lists of preparations not less than the total sum of 36,500 mixtures, each of which is designated by some particular name, and so prescribed.

The dispenser is expected to be prepared to furnish any one of this list of proprietary articles at a moment's notice, and assuming that on the average five new ones are called for every day, it would take him just twenty years to have handled the whole stock, by which time some of it certainly would have gotten a little bit stale.

How absurd to expect the pharmacist to be burdened with this immense quantity of useless truck, or to expect the physician to tax his mind with the consideration of it. Yet there is not a single day in this great city but that hundreds and hundreds of these articles are prescribed and dispensed. I find upon examining prescription files of recent date that a large percentage of the prescriptions are for proprietary articles. If it were not for scientific research, which still goes on, notwithstanding this hindrance; if it were not for the new discoveries and the new lights which occasionally flash out even in the midst of all this débris, it would seem that we were drifting back to an infinitely worse state of empiricism than prevailed in the mediæval ages.

Let us now review a few of these factory-made prescriptions, making the selections from those which are most frequently prescribed by professional men, and therefore presumably the best of the whole list.

Of the pills (comprising the greatest number of mixtures) the following prescription is one very frequently seen:

℞.

	Formula.
	Aloin, gr. $\frac{1}{5}$.
Pil. aloin strych. et belladon. comp.	Strych., gr. $\frac{1}{60}$.
(W: H. S. & Co.'s) No. xxiv.	Ext. bellad., gr. $\frac{1}{8}$.
Sig. one or two a day.	Ext. cas. sag., gr. $\frac{1}{2}$.

or the name within the bracket may be written P. D. & Co., McK. & R., W. R. W. & Co., B. & C., W. & H., H. T. & Co., T. & Co., H. B. & W., W. & B., M. & Co., S. & D., or other makers innumerable. These pills are offered dressed up in various coats, and in various forms. Now, what is there in this formula that the pharmacist and dispenser cannot prepare it? What is there in it that bushels of these pills are required to be kept on the shelves of the pharmacist, in the warehouses and in the wholesale drug houses, getting old and dry and hard, and otherwise unfit for dispensing? What is there in it that manufacturers by the score should claim proprietary right therein, insomuch as to claim that those of their particular make are not only equal to the best, but are superior to all others? And many of these manufacturers further add insult to injury by cautioning the prescriber to look out for substitutions by the unprincipled druggist, to examine the coating or the shape of the pills dispensed and catch the rascal in the act who would dare compound the prescription himself, or to put up Brown's make when Green's make was ordered.

The thousand and one other formulæ for pills are open to the same criticism, others, indeed, standing in a worse light, and savoring still more of the clap-trap nostrum business, being known and prescribed as a specific for some ailment, as, for instance, W.'s Anti-syphilitic Pills, T.'s Anti-dyspeptic Pills, M.'s Rheumatic Pills, etc., etc.

Of the elixirs, wines and syrups, a single one will serve as an illustration, as they all come in the same category:

℞. Elix. Ferri, Quin. et Strych. Phos. (. . . . .) ℥ iv.
Sig. One teaspoonful 3 times a day.

This elixir is probably the one (of the multitude) most frequently prescribed, and there being no recognized strength or formula for this preparation known to the manufacturers, each produces an article peculiar to himself. These elixirs vary in alkaloidal strength and have a still greater variation in the iron compound. The most popular one, perhaps, although purporting to be an elixir of phosphates, has been proven to contain no phosphate at all, and to be also deficient in the alkaloids claimed to be contained in it. A solution of citrate of iron and quinine in simple elixir, with a solution of strychnine added, will make a preparation so near like the one referred to that it is doubtful if an analyst even could determine a difference. This latter combination makes an elegant and stable preparation, and no doubt one of therapeutical value; but would not the prescriber be better served by ordering the quantity of cit. iron and quinine and strychnine desired, to be dissolved in a given quantity of simple elixir? The iron phosphates in solution are very prone to change, especially on exposure to the light. If the physician, however, desires a phosphate of iron with this combination of alkaloids, of standard and definite strength, I would respectfully refer him to the N. Y. & B., now to the National Formulary, for this, as well as for other kindred preparations.

I do not mean to imply, however, that all of these factory-made preparations are not true to name or to formula, but I do say that very many of them are not, and that the physician who prescribes them is in some degree groping in the dark.

There is still another class of articles approaching more closely even to the secret remedies which are so justly tabooed by the medical profession, and yet these articles are prescribed throughout the length and breadth of our land, although they are more insidious and damaging in their character than the worst of the other nostrums. The authors of these preparations not only claim proprietorship in them, but also in their very names; and, notwithstanding this, men of science will prescribe them who would be shocked at the thought of prescribing "Bear's Cough Syrup" or "Bonnet's Sarsaparilla." If they would but give this class of articles a second thought, they could not fail to see how unprofessional they are, and how serious a clog to scientific advancement.

The names of these articles, as in the other instances, are legion; they generally include the name of their promoters or some fictitious name selected, or else their authors coin new names for old articles, and lay claim to the whole business as exclusively their property and as primary articles of medicine.

As an example of this class, take "Bromidia," which is daily prescribed by medical men, and used largely by the laity as well. In the advertisements of this article I observe the formula is given, "Every fluid dram contains 15 grains each of pure chloral hydrat. and purified brom. pot., and ⅛ grain each of gen. imp. ext. cannabis ind. and hyoscyam."

"Dose, ½ to 1 fluid dram in water or syrup every hour until sleep is produced."

The "indications" given are almost as numerous as will be found on the yellow wrappers of the cure-all remedies so liberally advertised in the daily papers, and the only real difference is, this article is advertised for the eye of the medical profession, the other to the general public; they both point out the symptoms of ailments they are intended to relieve or cure, and they are equally unprofessional. I know it is claimed for this article that it is not a secret preparation. The proprietors give away the formula and retain for themselves nothing but the hollow name, upon which they spend thousands upon thousands of dollars in advertising it; how magnanimously generous!—and I presume it is to repay them for such generosity that medical men prescribe "Bromidia" and like articles. If the preparation be true to formula given, what other excuse can physicians have for prescribing a proprietary article? If the indications be such that the prescriber desires his patient to take 15 grains of pure chloral hydrate, 15 grains of purified bromide of potassium, and ⅛ grain each of genuine imported extract of cannabis indica and hyoscyamus, why does he not write his prescription for it, instead of prescribing a "patent medicine?" One may answer that he cannot carry the formula in his head; that this combination has had a satisfactory effect, and he desires to use it again. Well, then, I would respectfully suggest that he write for elix. chloral comp., after the formula for "Bromidia," and have it so dispensed.

If, on the other hand, the article is not true to formula given, then it is a deception and a fraud, and should on this score be obliterated from the vocabulary of medicines, as well as all others of its ilk. In this connection I would point out the important fact, that the medicinal properties of "genuine imported extract of cannabis indica" reside in a volatile oil and green resin, which are not held in solution in a liquid no stronger in spirits than "Bromidia," and the presence of 20 per cent. of salt further interferes with solution, and, moreover, if it were in solution or even suspended, the preparation would have a greenish tint.

This article was not singled out for any particular reason, further than that, under my observation, among the preparations of this class, it led in the frequency of prescriptions for it. There are scores of other like preparations which might just as well have been selected.

To conclude, I contend that the whole of these 36,500 proprietary articles above referred to are totally unworthy the distinction of being prescribed by medical gentlemen, that they are directly at variance with scientific progress, that their promoters have contributed absolutely nothing of value, and that had they never existed both medicine and pharmacy would have this day reached a higher plane in the developments of science.

These so-called manufacturers of pharmaceutical preparations have simply gathered together a lot of old prescriptions of different physicians, and these, with the mixing together of sundry principles, which their peers have eliminated, constitute their whole stock in trade. In this long list of preparations they have originated nothing, except their grand scheme of appropriating the work of others, perverting its application, and by a system of advertising, saddling it upon medicine and pharmacy, which bear the burden, and these schemers enjoy the pecuniary benefits. The load is becoming more and more burdensome, and I feel that we have submitted to the imposition long enough, and that we should rise up and drive the enemy from their strongholds, which can be readily done by concerted action.

Theirs is a garrison whose commissary stores are in the hands of their natural enemy. Cut off their supplies, and they will very quickly "seek other fields and pastures new."

New York, June, 1887.

MR. ROGERS.—This paper appeals to all of us; we all understand the evils of which it speaks. But I think the paper should have been presented to the Medical Association, who alone can remedy the evil as far as any remedy can be applied. There is only one course left us. I suggest that so far as possible our argument, our statement is presented, and that this paper be brought to the attention of the physicians of the country. I suggest that the physicians of this country can apply the remedy. We have dealings with them more or less, and as I know from my own experience they are able to cure these evils, and a good deal of missionary work could be done in this direction.

After some discussion, a motion to publish this paper for general distribution to physicians in the United States was tabled.

A paper by Alfred B. Taylor on Weights and Measures was read, leading to considerable discussion.

WEIGHTS AND MEASURES.

BY ALFRED B. TAYLOR, A. M., PH. M.

The introduction of any new system of weights and measures to take the place of one long established and in general use, is one of the most troublesome and difficult exercises of legislative authority; an almost unmanageable difficulty has been found in the adoption of a new nomenclature; but of all the difficulties to be overcome, perhaps the greatest is the abandonment of old and familiar units or standards.

"Weights and measures may be ranked among the necessaries of life, to every individual of human society. They enter into the economical arrangements and daily concerns of every family. They are necessary to every occupation of human industry; to the distribution and security of every species of property; to every transaction of trade and commerce; to the labors of the husbandman; to the ingenuity of the artificer; to the studies of the philosopher; to the researches of the antiquarian; to the navigation of the mariner, and the marches of the soldier; to all exchanges of peace, and all the operations of war. The knowledge of them as in established use, is among the first elements of education, and is often learned by those who learn nothing else, not even to read and write. This knowledge is riveted in the memory by the habitual application of it to the employments of men throughout life. Every individual, or at least every family, has the weights and measures used in the vicinity and recognized by the custom of the place. To change all this at once is to affect the well-being of every man, woman and child in the community. It enters every house, it cripples every hand."

The failure that attends the introduction, and the objections that have so far prevented the adoption of the metric system in Great Britain and in the United States, notwithstanding the most strenuous and persistent efforts of its advocates, sufficiently attest the need of some other scheme, which, while possessing the advantages claimed by that, may be free from its disadvantages and defects.

Great Britain has shown such a determined opposition to the metric system, that in the International Monetary Conference, held in Paris in 1867, she refused even to negotiate in reference to unity of coinage, and her delegates stated that "until it should be incontestably demonstrated that the adoption of a new system offered superior advantages, justifying the abandonment of that which was approved by experience and rooted in the habits of the people, the British Government could not take the initiative in assimilating its money with that of the Continent."

She maintains the most complex system of measures, weights and coinage now in use among civilized nations; she persistently rejects the decimal system, and adheres to the complex division of pounds, shillings and pence, a system abandoned by the United States in their rejection of colonial dependence.

Our weights, measures, and coins at present correspond much more nearly with the English than with the French standard. Our commerce with Great Britain is very much greater than with any other nation, and we should certainly commit a great error in adopting the metric system, unless Great Britain should consent to adopt it also.

Our adoption of the metric system, and the consequent change of our linear unit, would sever our uniformity with Great Britain, a country with which perhaps three-fifths of our foreign commerce is transacted; besides which it would entail great inconvenience, and much greater expense than is generally imagined. The measurements of every plot of ground in the United States have been made in acres, feet and inches, and are publicly recorded with the titles to the land, according to the record system peculiar to this country. What adequate motive is there to change these expressions into terms which are necessarily fractional, and in which those foreign nations, whose convenience it is proposed to meet, have no conceivable interest? What useful purpose is subserved by designating a building lot 20 x 100 feet, in the form of 6.095889 × 30.479448 metres?

Besides this, the industrial arts, during the last fifty years, have acquired a far greater extent and precision than were ever known before. Take, for instance, the machine-shops, in which costly drawings, patterns, taps, dies, rimers, mandrils, gauges, and measuring tools of various descriptions for producing exact work, and repetitions of the same with interchangeable parts, are in constant use. It has been calculated that in a well-regulated machine-shop, thoroughly prepared for doing miscellaneous work, employing 250 workmen, the cost of a new outfit, adapted to new measures, would be not less than $150,000, or six hundred dollars per man.*

Supposing full consent were obtained for using metric measures in all new machinery, how slow and difficult would it be to make the change. A very large proportion of work consists in renewing worn parts: where then are the new measures to come in? The immense plant of railway motive power in the United States is all made to inches and parts. At what time can a railway company afford to change the dimensions of the parts of a locomotive engine? At no time, because the change would require to be simultaneous in the whole stock. It is true that the old dimensions might be adhered to, and called by metric names, putting 0.0254 metres, or 25.4 millimetres for one inch; but this would be only an evasion, not a solution of the problem.

The system in use in this country has three units: the *yard*, consisting of 36 inches; the *troy pound*, consisting of 5760 grains; and the *wine gallon*, containing 231 cubic inches; these units being entirely independent

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"* The Metric system in our Workshops, etc.," by Coleman Sellers. Journal of the Franklin Institute, Philadelphia, June, 1874.

of each other. Upon these units our various tables of weights and measures have been constructed, without regard to regularity or fitness for the practical purposes to which they must be applied, or without any approach whatever to uniformity or similarity in the various multiples or divisions of the units.

Any comprehensive or strictly philosophical system can have but one unit, which must give law throughout. That unit will be most naturally a linear measure, and whatever its derivation, where a change is made, the coincidences between the old and new ratios will necessarily be rare. All that can be done is to choose such a unit as will produce the most of these.

A specified number of inches might be taken as the standard, and from this all other measures, including those of surface, capacity, and weight, derived; or, if it should be considered preferable to retain the grain weight instead of the linear unit, the side of a cube containing a weight of water equal to a specified number of grains, might be taken as the standard. For example, if the side of a cube of water weighing 256 grains should be taken, it would vary very slightly from the inch; a cubic inch of water at its greatest density weighing 252.745 grains; such a cube would measure 1.004334 inches.

The grain is a standard so widely used, and in medicine especially is one of so great value, as the exponent of so much knowledge and experience, that it should not be lightly set aside, and its surrender is a sacrifice which ought to be compensated by very undoubted advantages. So far as pharmacy is concerned, it would seem to be the most important unit to be preserved. Not only is it at present the recognized measure of the physician and pharmacist throughout a great portion of Europe—that in which chiefly is embodied the long-acquired experience and accumulated knowledge of the healing art, the laboriously ascertained and accurately observed relation and value of all the more active portion of the materia medica—but it is the measure which, outside of our profession, is the one almost universally employed as the unit of comparison for all minute investigations and precise determinations. If either one should be adopted, the other would have to be abandoned; and, upon careful consideration, notwithstanding the great importance of the *grain*, there can be but little doubt that the *inch* would be retained with greater advantage and less disturbance than the *grain.*

Should the metric system, however, be introduced, both the inch and the grain must be discarded.

Within a few years past, various schemes have been proposed for promoting uniformity, but unless some one of them could be universally adopted, the confusion and complication would be increased instead of being diminished.

Prof. Oscar Oldberg has proposed for adoption by pharmacists and physicians a new system, based upon the gramme. He proposes to divide the gramme into sixteen parts, called grains, thus making a new grain a little smaller than the present grain; four grammes to make a drachm; eight drachms to make an ounce; and sixteen ounces to make a pound. The pound thus would consist of 8192 new grains, or about 7900 troy grains.

Even if this scheme could be adopted universally by pharmacists, which does not appear probable, it would but increase the difficulties under which we are now laboring; it would only add one more to our already long list of tables of weights and measures to be learned.

There is no good reason why we, as pharmacists, should have a special scale of weights and measures. Many of the evils experienced by us are those prevailing in all departments, and no improvements or reforms can be either efficient or enduring which do not look to the welfare of the whole. It will be found impossible to give exclusive and confined attention to the weights and measures of our own profession; there is absolute necessity of conformity among all the measures of trade and commerce, and of the reference of all to common laws and to a single standard.

These remarks will also apply to the scheme proposed by Mr. Wm. L. Turner, published in the Proceedings of the Pennsylvania Pharmaceutical Association, 1886.

Mr. Turner proposes to divide the "gramme" into 15 parts, called "grains;" to make the ounce equal to 500 of these "grains," and the pound equal to 14 ounces, or equal to about 7200 troy grains.

Before attempting any change, it should be well considered whether we have attained all the benefit within our reach, or whether, at no greater cost, we might not reap the advantages of a far more perfect system.

In a Report on Weights and Measures previously read before this Association, we have shown that the decimal subdivisions and multiples of the units are the inseparable and insuperable defects in the metric system, and have endeavored to show the superior merits and advantages of an Octonary system. This report was presented in 1859, and was published in the volume of Proceedings of that year. As it is probable that very few of the members now present have ever seen that report, we have ventured, at the risk of being considered somewhat prolix, to make a few extracts from it:

"A decimal system applied to weights and measures must result in failure as regards the convenience of such a system, or its adaptation to popular wants, and this want of adaptation arises from inherent defects in the decimal system of numeration."

"A practical defect in the working of the metric system, which has been demonstrated by experience, is its incapability of binary divisions, a defect which of course attaches equally to every decimal scale; and one which has always strikingly displayed itself wherever this scale has been brought into popular use, either for the estimation of lengths, bulks, weights or values . . . In our own country the decimal scale has been applied only to the currency, and we find that in spite of the legal division of the *dollar* into tenths, and its seeming establishment by the coinage and circulation of *dimes*, the people persist in cutting it up into quarters, eighths, sixteenths, and even thirty-seconds, to the utter neglect of the coins actually established by law, and to the inconvenience, confusion and loss resulting from the necessary involvement of interminable and unmanageable fractions."

"Many have supposed that this is all a matter of practical indifference, and that it merely requires the decisive sanction of legislative authority to accustom a people to any set of subdivisions. Such an opinion, however, exhibits both a blindness to the lessons of all experience, and an inattention to many of the most important and subtle theoretical considerations affecting the relations of value, and our apprehension thereof."

Binal progression may be regarded as pre-eminently the natural scale of division. This fundamental fact is indeed illustrated in the very origin of the word *division*. The binary scale is in the first place the lowest and simplest of all geometrical progressions. It is that of which we may have the most ready and precise conception; indeed, it may be said to be the only one of which we have any accurate appreciation beyond the second or third term. Thus, 1, 2, 4, 8, 16, 32, 64, etc., can be readily apprehended as repeated doublings, while 1, 3, 9, 27, 81, etc., leave the mind confused in the attempt to follow up successive triplings. It is that by which we most rapidly and nearly approximate any vague quantity we may desire to employ; hence its universal use in trade. It is that which in any system of independent units of measure (as in weights or coins) furnishes us with the means of representing the greatest range of particular values, by the smallest number of pieces. It is that which affords us the easiest practical measure; thus, we can fold a string, a sheet of paper, or any other flexible material, or we can cut an apple, or a loaf of bread, at once and with great precision, into halves, quarters and eighths, while we should have to make repeated trials to divide the same into thirds or fifths, and then attain the result only tentatively and approximately. And lastly, it appears to be the most natural of scales, from the very common use of the two hands in separating objects into pairs. Such being the claims, then, of the binary scale of geometrical progression, and such its obvious advantages over all others, it is not surprising that this should be found to be practically the prevalent mode of distributing the more common weights and measures throughout the world, whatever may be the multiples or divisions enacted by law.

The Roman weights, in general use throughout the empire (that is, throughout the civilized world), for some centuries after the Christian era, were, by means of intermediate sub-divisions (introduced by the common consent of traders), practically distributed upon a binary scale; so with the divisions in universal use at the present day, we find that a nest of Avoirdupois weights, comprises ¼ ounce, ½ ounce, 1 ounce, 2 ounce, 4 ounce, 8 ounce, and 16 ounce, or 1 pound, and sometimes a 2 pound weight, and a 4 pound weight; and by this scale of binal progression or division, almost everything is purchased at retail. Our yard-sticks are found to be divided, not into the legal feet and inches, but into halves, quarters, eighths, and sixteenths. Precisely so with the inch, which is never divided into its primitive "three barley-corns," but almost always like the yard, by the binal scale into eighths and sixteenths, though occasionally divided for particular purposes into twelfths or into tenths. The operation of this great law is quite as strikingly exhibited in France, where the popular necessities have compelled the introduction of binal divisions, not recognized by the established decimal scales, nor, indeed, strictly compatible therewith.

Mr. Peacock, in his admirable treatise on "Arithmetic," in the Encyclopedia Metropolitana, thus sums up his review of the French system: "The decimal sub-division of these measures possessed many advantages on the score of uniformity, and was calculated to simplify in a very extraordinary degree the arithmetic of concrete quantities. It was attended, however, by the sacrifice of all the practical advantages which attend subdivisions by a scale admitting of more than one bisection, which was the case with those previously in use; *and it may well be doubted whether the loss in this respect was not more than a compensation for every other gain.*" Such a statement from one who has given the whole subject so careful a study, certainly deserves our most serious consideration.

The masterly and comprehensive report on the subject of weights and measures, made to Congress in 1821, by Mr. Adams, when Secretary of State, contains the following judgment: "The experience of France has proved that binary, ternary, duodecimal, and sexagesimal divisions are as necessary to the practical use of weights and measures as the decimal divisions are convenient for calculations resulting from them; and that no plan for introducing the latter, can dispense with the continued use of the former. * * * * From the verdict of experience, therefore, it is doubtful whether the advantage to be obtained by any attempt to apply decimal arithmetic to weights and measures, would ever compensate for the increase of diversity which is the unavoidable consequence of change. Nature has no partialities for the number ten; and the attempt to shackle her freedom with them will forever prove abortive."

So in the interesting paper of Dr. Ellis (in the American Journal of Pharmacy, vol. 2, page 202), the French decimal system is thus referred to. "Every one is struck, at the first glance of this system, with the beautiful simplicity which it derives from decimal arithmetic. It appears, however, to have been overlooked, that, although decimal arithmetic is admirably designed to facilitate the calculation of mere number, it is not equally well suited to the divisions of material things."

Much to the same effect has been the result of the commission appointed lately in England to consider the subject of a decimal coinage. The commissioners, after a full discussion and investigation of the subject, have very recently reported against any change; their report being drawn up in the form of a series of twelve resolutions. The seventh resolution is as follows: "That as regards the comparative convenience of our present coinage, and of the pound and mill scheme, for the reckonings of the shop and the market, and for mental calculations generally, the superiority rests with the present system, in consequence, principally, of the more convenient divisibility of 4, 12 and 20, as compared with 10, and the facility for a successive division by 2, that is for repeated halving, in correspondence with the natural and necessary tendency to this mode of subdividing all material things, and with the prevalence of binary steps in the division of our weights and measures."

"The number ten," remarks Mr. Anderson, in his treatise on arithmetic, "has been adopted by every civilized nation for the radix of the numerical scale. It has no peculiar advantages to recommend it, and seems to have been selected for that important function, merely because it expresses the number of the human fingers. We must regret that a circumstance so totally unconnected with every scientific consideration, should have determined an elemental principle of the last importance to one of the most abstract, as well as one of the most useful of all the sciences, and that the decimal notation should still be retained, notwithstanding its evident imperfections and the superior claims of other scales." (Edinburgh Encyclopedia; edited by Sir David Brewster, art. "Arithmetic," vol. 2, page 411.)

Decimal arithmetic appears to be coeval and co-extensive with the human race. It is, indeed, perhaps, the most universal of human institutions, at least as universal as language itself. From this universality, most writers have called it the "natural" system; but on examining the question whether the number *ten* possesses any intrinsic excellence or convenience to recommend it, any peculiar fitness as a ratio of geometrical progression, we find but one answer: it has none. It differs from any other number only in quantity, not in quality. So far from its presenting any merit or advantage over its compeers, it is almost the last number which a true science of arithmetic would have selected for the important function of a radix of numeration. Its universality flows simply from the fact that the necessities of man impelled a selection, in the very earliest infancy of the race, long before the invention of letters, and while yet a language was but slowly being formed; and the selection comes to us stamped with the crude impress of a most irrelevant accident! Decimal numeration is "natural" only in the sense that *ignorance* is natural. The fingers have no more real or "natural" relation to the properties of number, than have any other organs of the human body; and mathematically or philosophically considered, the digit is, therefore, no more a typical *unit* than a tooth (of which there are thirty-two), or the leg of a spider (of which there are eight), or the petal of a flower (of which there may be any number). Nor have any but the most ignorant races, those without a literature and an alphabet, ever occasion to group and tally by their fingers. Only from unlettered savages could such a scale, therefore, have been derived."

After a full and perhaps somewhat tedious discussion of the merits and demerits of various systems of numeration, we have proposed an Octonary system, which we believe to have the germ of vitality that must eventually secure its empire. Its adoption is only a question of time. We have based our system upon a new standard or unit, and have derived therefrom a complete series of weights, measures and coins.

Upon the adoption of an Octonary system of numeration, this unit should be insisted on; in view, however, of various considerations, among which are the desire to retain our established unit of linear measure, the inch; and as a consequence of its retention (as will be shown hereafter), the very slight changes required in our measures of capacity and weight, thus causing the least possible disturbance of our present system of weights and measures, we believe it possible to construct an octonary system of weights, measures and coinage, that shall embrace in an equal degree with the metric system, all the great elements of simplicity and uniformity; and while a new standard would be more philosophical, we believe that the adoption of the English inch or multiple of it, the inch being the one thirty-sixth part of the standard yard, which is also our standard yard, with an octonary distribution of the various tables of weights, measures and coins, would be much more readily accomplished, since it would leave undisturbed all linear measures of Great Britain and of the United States, and would, in our opinion, possess all the essential elements for a successful adoption by both countries.

It would also serve to prepare the public mind for the further introduction of the Octonary system of numeration.

In selecting a standard of measure (without any reference to its ideal derivation), two considerations of very obvious and primitive notice, impose a tolerably definite limit, as to what should constitute the length of a useful, popular measuring rule. The first is that it should be conveniently portable, if not in a pocket, at least in a satchel, or upon the thigh; the second is that when held by one hand in careful and precise position for taking or giving measures, its two ends should each be distinctly within accurate view, and within easy reach of the free hand for minute marking, without any constraint or effort of the body. These two conditions, which would both be assigned on perhaps one-half the occasions of its familiar use, render it tolerably manifest that its length should be not less than twelve inches, and while certainly excluding the yard-stick and the metre, would probably designate the carpenter's two-foot rule as reaching the maximum limit of practicable length. Both the French metre and our yard-stick are very awkward and inconvenient standards, being too long for all the ordinary purposes of mensuration, excepting itinerary measure, and as a popular standard utterly worthless except on the counter of the draper. Moreover, we would naturally select such a rule as we would measure our houses by, or the furniture within them; such a rule as the carpenter would cut or lay off his boards by; such a rule as the mechanic could use in his workshop, or the machinist handle in fitting his engines. A sixteen-inch rule would fall clearly within this natural and essential limitation. Theoretically it matters little whether our unit of reference be the inch or the mile; but for the practical business of daily life, it becomes a matter of the very highest importance that our unit of measure should be such a one as shall have the most convenient and universal application.

We would, therefore, propose to select for our standard a sixteen inch rule, which we would call a "*module*," it being the "*modulus*" of our system. The square of this would furnish the basis of our table of area, or surface measure, while the cube of it would give us our "*modius*," or standard measure of capacity; and the weight of a modius of distillled water would give us our "*pondus*," or standard of weight.

Thus we would adopt the module as the universal standard. In this respect we perceive a great superiority in our linear unit, over the French system. From the inconvenient size of the *metre*, *it* has been made practically a standard only of lengths. The *are*, the unit of surface, is derived, not directly from the *metre*, but from the *decimetre;* the *litre*, the unit of capacity, is derived from the cube of the *decimetre;* and lastly, the *gramme*, the unit of weight, is derived from the cube of the *centimetre*. The contrasted simplicity of our project needs no comment.

By octaval subdivisions of this standard module of sixteen inches, we should have for its eighth a measure of two inches, which we may call for the present a "*digit;*" for the eighth of this digit, a measure of a quarter of an inch, which we may call a "*dent;*" for the eighth of this dent, a measure of a thirty-second of an inch, which we may call a "*line;*" and for the eighth of this line, a measure of one two hundred and fifty-sixth of an inch, which we may call a "*point.*" The point gives a dimension about that of a section of the human hair, or of a very fine grain of sand, and may be considered about the limit of visible magnitude. It is, therefore, a very suitable origin of linear value, while it is an equally appropriate point of departure for microscopic measurements. The "*dent*" and the "*digit*" would be convenient measures for small articles; while our "*module*" gives us one of the most convenient rules that can be devised, the "*rod*" furnishes us with a highly useful ten-and-a-half foot measuring pole, and 8 times this measure gives us the best "*chain*."

Our linear measures being founded upon the inch, would of course give a series of measures entirely commensurable with those at present in use.

We herewith present our

TABLE OF LINEAR MEASURES.

			Yards.	Feet.	Inches.
		1 Point =			$\frac{1}{256}$
8 Points	=	1 Line =			$\frac{1}{32}$
8 Lines	=	1 Dent =			$\frac{1}{4}$
8 Dents	=	1 Digit =			2
8 Digits	=	1 MODULE =		1	4
8 Modules	=	1 Rod =	3	1	8
8 Rods	=	1 Chain =	28	1	4
8 Chains	=	1 Furlong =	227	1	8
8 Furlongs	=	1 Mile (New) =	1820	1	4

From the above table it will be seen that—

4 Dents or ½ Digit are equal to one inch;
6 Digits are equal to one foot;
2¼ Modules are equal to one yard;
3960 Modules are equal to one mile (1760 yards).

While our new Mile would exceed this amount by—

136 Modules, or 60 yards, 1 foot and 4 inches.

Our Table of Area, or surface measure, for which, however, the apothecary has very little professional use, would of course be derived directly from our linear measures, by the familiar law of squares.

TABLE OF SQUARE MEASURES.

8 Dents	square	or 64	square	Dents	make	1	Square	Digit.
8 Digits	"	" 64	"	Digits	"	1	"	MODULE.
8 Modules	"	" 64	"	Modules	"	1	"	Rod.
8 Rods	"	" 64	"	Rods	"	1	"	Perch.
8 Perches	"	" 64	"	Perches	"	1	"	Furlong.
8 Furlongs	"	" 64	"	Furlongs	"	1	"	Mile.

In like manner the "MODIUS," or cube of the Module (4096 cubic inches) would give by successive octaval divisions, a series of measures, and the weight of their contents a series of weights, as follows: A Modius of distilled water at its maximum density gives us our "PONDUS," which is equal to 147 pounds 14 ounces and 118 grains Av. One-eighth of this would give a cubic measure of 8 linear inches, or 512 cubic inches, weighing 18 lb. 7 oz. 343 gr., which we may call a "*stone;*" one-eighth of this, a cubic measure of 4 inches, or 64 cubic inches, weighing 2 lb. 4 oz. 425 gr., which we may call a "*libra.*" While the "Pondus" is the standard of determination, the *libra*, as the unit of weight in most common use, would be the secondary or derivative standard. One-eighth of the libra would give a cubic measure of 2 inches, or 8 cubic inches, weighing 4 oz. 272 gr., which we may call an "*unce*," or new ounce; one eighth of this, a cubic measure of 1 inch, weighing 252.745 grs., which we may call a "*semy;*" one-eighth of this, a cubic measure of ½ an inch, or ⅛ of a cubic inch, weighing 31.5 grs., which we may call a "*scrap;*" ⅛ of this, a cubic measure of ¼ of an inch, or $\frac{1}{64}$ of a cubic inch, weighing 3.949 grs., which we may call a "*carat;*" and one-eighth of this a weight of .493 gr., which we may call a "*mite.*"

If instead of 16 inches we had chosen for our Module 16 times the length of the cube of water weighing 256 grains, as before suggested, all of our weights would have been in even grains, while our measures would have been fractional quantities; thus, our "*Module*" would be equal to 16.069344 inches, and our "*Pondus*" would weigh 149 lbs. 12 oz. and 326 grs.; our "*scrap*" would be exactly 32 grains; our "*carat*" exactly 4 grains, and our "*mite*" exactly half a grain.

We herewith present a table showing the divisions and multiples of the "Modius," with their equivalents in Apothecaries' or Wine Measure, and in cubic inches; also the divisions and multiples of the "Pondus," with their corresponding Avoirdupois weights; and the connection between the measures and weights:

TABLE OF MEASURES OF CAPACITY AND WEIGHTS.

Measures.	Wine Measure.					Cubes.	Cubic Inches.	Weights.	Avoirdupois.		
	Gallons.	Pints.	Ounces.	Drachms	Minims.				Pounds.	Ounces.	Grains.
1 Parvum =					.519 =	⅛ in. =	$\frac{1}{512}$ =	1 Mite =			.4936
8 Parvums = 1 Morsel =					4.15 =	¼ " =	$\frac{1}{64}$ =	1 Carat =			3.949
8 Morsels = 1 Ligule =					33.2 =	½ " =	$\frac{1}{8}$ =	1 Scrap =			31.593
8 Ligules = 1 Cup =				4	26. =	1 " =	1 =	1 Semy =			252.745
8 Cups = 1 Gill =			4	3	29. =	2 " =	8 =	1 Unce =		4	271.96
8 Gills = 1 Quart =		2	3	3	59. =	4 " =	64 =	1 Libra =	2	4	425.68
8 Quarts = 1 Octa =	2	1	11	7	54. =	8 " =	512 =	1 Stone =	18	7	342.94
8 Octas = 1 MODIUS =	17	5	15	7	18. =	16 " =	4096 =	1 PONDUS =	147	14	118.52
8 Modiuses = 1 Pipe =	141	7	15	2	24. =	32 " =	32768 =	1 Ton =	1183	2	73.16
8 Pipes = 1 Butt =	1135	7	10	3	12. =	64 " =	262144 =	1 Load =	9465	1	147.78
8 Butts = 1 Hold =	9087	5	3	1	36. =	128 " =	2097152 =	1 Keel =	75720	10	307.24

One of the great beauties and advantages resulting from octaval divisions is shown by this table. It will be observed that all of the multiples and divisions of the "*Modius*," or cubic Module, are *perfect cubes*, and while they furnish us with a series of perfectly symmetrical measures, the weight of the contents of these measures in distilled water, gives us a precisely corresponding series of weights.

By the simple device of using multiples of one, two, and four times the size of such of these weights or measures as may be desirable, the use of fractions is entirely avoided, and a perfect system of weights and measures is supplied, by which any conceivable amount can be easily and accurately weighed or measured. Here again we perceive another beauty in our system, that it gives a maximum range of expression, with the minimum number of pieces.

Of the above weights, those in ordinary use by the apothecary would be the *mite*, the *carat*, the *scrap*, the *semy*, and the *unce*.

	Avordupois. Oz.	Avordupois. Grains.
1 Mite =		.4936
1 Carat =		3.949
1 Scrap =		31.593
I Semy =		252.745
1 Unce =	4.	271.96

Weights of once, twice, and four times the quantity of each of these weights, or in all 15 weights, would enable us to weigh any possible quantity of *mites* from one (which is less than half a grain) to 16,170 grains; that is to say, we could weigh 32,760 different quantities; these 15 weights would take the place of the following 19 weights which are now used to accomplish nearly an equivalent purpose, viz., ½ grain, 1, 2, 3, 4, 5, 6, 10, 20, 30, 40, 60, 120, 240 grains troy, together with avoirdupois weights of 1, 2, 4, 8, and 16 ounces. These 19 weights make a total of 14,104 grains, and would consequently be sufficient to weigh any number of half grains from 1 to 28,208.

Upon examination of the above tables, it will be seen that the *mite* is very nearly equal to ½ grain, the difference being $\frac{64}{10000}$, or about $\frac{1}{150}$ of a grain; *two mites* being about $\frac{1}{78}$ less than one grain. One *carat* is very nearly equal to 4 grains, being about $\frac{1}{20}$ of a grain less. One *scrap* is a little more than 1½ grains over the half drachm. One *semy* is 34 grains more than ½ oz. av., or 12¾ grs. more than ½ oz. troy; while 4 *unces* are equal to 1lb. 2½ oz. av., nearly.

Of the fluid measures, the *ligule* is equal to 3.2 minims, more than half a fluidrachm, 2 ligules being 6.4 minims, more than a fluidrachm, or the medicinal teaspoonful; the *cup* is equal to 26 minims, more than half a fluidounce; the *gill* is equal to 3½ fluidrachms, more than four fluidounces; *four gills* are equal to one pint and 1¾ fluidounces, and the *new quart* is equal to one quart and 3½ fluidounces.

The smaller of these weights and measures assimilate so nearly with our present divisions, that for most practical purposes in medicine or pharmacy, the difference would be inappreciable.

It is true that all the valuable knowledge that clusters about the grain weight, in statistics of all kinds, would have to be recalculated in the new weights, but as has before been stated, this is a necessary consequence of *any* change in our unit.

It is believed that the scheme here proposed, independently of its merits, would make less disturbance in our present system of weights and measures than any that has yet been proposed, and it would therefore be more easily introduced and accepted.

An entire remodelling of our coinage would of course be necessary under a complete octonary system; it would, however, occupy too much time to consider the matter here.*

These suggestions are herewith presented, not with the desire that they may be adopted by this Association, nor yet by the Decennial Pharmacopœial Convention, but on the contrary to prevent, if possible, any ill-advised and hasty action on the subject by these bodies, and to promote discussion and investigation, so that the matter may be fully considered in all its bearings.

It is believed that desirable results can be arrived at only by the consultation and agreement of an International Convention, assembled for the purpose of establishing permanent and universal uniformity of weights and measures.

The only proper functions, either of this Association, or of the Pharmacopœial Convention, are merely to suggest such improvements as may be deemed expedient, since Congress alone has power to fix the standard of weights and measures; and to urge upon Congress the importance of calling a convention for consulting upon the subject of weights and measures, with reference to the principle of uniformity as applicable to them.

I will close this paper with an extract from the report made by John Quincy Adams, which we have previously had occasion to quote.

"If there be one conclusion more clear than another, deducible from all the history of mankind, it is the danger of hasty and inconsiderate legislation upon weights and measures . . . All trifling and partial attempts of change in our existing system, it is hoped, will be steadily

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* In reference to this subject, see a paper by the author, on "Unification of Moneys, Weights, and Measures," published in the International Review, New York, October, 1882.

discountenanced and rejected by Congress; not only as unworthy of the high and solemn importance of the subject, but as impracticable to the purpose of uniformity, and as inevitably leading to the reverse, to increased diversity, to inextricable confusion."

MR. MENNINGER.—It is with extreme hesitation that I rise to make a remark on so valuable a paper by a man like Mr. Taylor; at the same time something strikes me very forcibly in hearing this paper read. Mr. Taylor objects to the introduction of new names and of a new system; and he immediately inverts a new name and a new system. His argument, it strikes me, is plainly inconsistent. The metric system designates the various quantities by names which are comprehended without any difficulty. The transition stage is spoken of by Mr. Taylor as being dangerous, where, for example a survey had been had by acres, rods, and chains; the danger was quite as great when the metric system was introduced into France, Germany, Austria, Belgium, and Holland. It is true that the English cling with great tenacity to old traditions and notions; but England will have to come to the decimal system. Her scientific men have adopted it without an exception, and have given their approval to it. That is the message of the old world to the new one. But to come to Mr. Taylor's paper. He may object to the names of gram, milligram, centigram, and decigram, as being hard to impress upon the young. Now he adopts names like points, lines, dots, digits, modules—that have an entirely different significance from that which he would give them here. Again, module, parvule, cups—this word cups reminds me of old cooking receipts: eight cups of flour, and four cups of milk; it was always difficult to know what a cup meant, but this would settle it definitely. This paper is too long to go over the whole of it, and give an extended criticism, but I call attention to the inconsistency of rejecting the decimal system for the octonary system, while our present one is not an octonary system, and our present rod would be no longer the same rod. There is an old adage that the proof of the pudding is the eating of it. When I was a boy at school in Germany, I learned all my tables on the old system, and I knew all about furlongs and acres. When I went back there in 1871, the young people were all talking about metric measures, and the old people would ask, how many pounds or how many acres is that? But take the present generation in those countries, or those who are immigrating to this country from Germany and France; this system is quite familiar to them; the government allowed several years to introduce it; after that no contracts were legal except in the metric system. Now when a man is compelled to do certain things through certain legal necessities, he will pretty soon learn the metric system and become familiar with it. The present generation of Frenchmen and Germans, coming to this country, have to be told what a pound is, an ounce, a mile, and a furlong. It went like wildfire through Europe, and to-day the people there understand that system. But Mr. Taylor has taken great pains to demonstrate that the octonary system is a natural system. There is a natural division of weights, but there is no natural division of distance; but there is a convenience of division, and when you take the earth's circumference, which is certainly the most natural standard to take, and sub divide it by ten, and go on with your sub-divisions by ten, there is a facility of calculation which no other system can possibly approach.

MR. SHEPPARD.—Mr. Taylor has certainly stated a self evident fact when he says that a division by two is natural, but unfortunately we and our ancestors in the far distant ages are suffering from the mistake of somebody, away back in distant time when one, two, three, four, five, six, seven, eight, nine, ten, was made our system of notation. If that man or body of men had left out eight and nine, and given us 1, 2, 3, 4, 5, 6, 7, 10, our hundred would then have been sixty-four, and we should have had a perfect subdivision by two. But no one is so foolish as to suppose that that can ever be changed. Therefore let us make the best of it; and will any man of broad observation assert that any system has been brought to the world which, with the system of ten, has been so practical—I use that word advisedly, and would emphasize it—which has been so practical as the metric system? It seems to me, sir, that every man of broad observation, however much he may wish that 8 and 9 had been left out, must feel that the metric system will be the system of the future, however much he may have wished to the contrary.

MR. ZWICK.—The paper read by Prof. Remington is a good one, and I would like to hear whether he endorses that paper.

MR. REMINGTON.—I did not expect to speak on it, and what I have to say will be said in a very few words. Whilst I cannot follow Mr. Taylor in his argument all through, Mr. Sheppard has expressed my views exactly. Life is too short. We can never expect to realize the ideal that Mr. Taylor sets up here. We ought to have stopped at 8 and not gone to 10; but it is impossible ever to change, and I do not believe Mr. Taylor thinks that the time will come. It will be seen that he has spent a great deal of time, research and thought upon this paper, but as he said to me, he cannot expect the American Pharmaceutical Association to adopt the views he has expressed. He knows the importance of the subject, but he only desires to bring before this Association and before the Committee on the Revision of the Pharmacopœia soon to adopt a system, these views, in order that the whole subject should be very carefully considered. I would like to see, what I think every one would like to see, if it be possible, that some way be found by which we could have an octonary system grafted upon the decimal or metric system. I am on record with a great many people as being an advocate of the metric system. I believe it is the most comprehensive and practical system of weights and measures ever devised. Just now it is very unpopular, but I believe eventually Great Britain and the United States will both have to come to it. (Applause.)

MR. THOMPSON.—I rise to express my thanks to Mr. Taylor for bringing out clearly in this paper the fact that the pharmacists do not require for their business any special system of weights and measures; that the effort on the part of pharmacists to adopt this system of weights and measures for their use has involved a great deal of trouble and controversy, and if we had acknowledged long ago that the avoirdupois system of weights and measures was just as good for us to use as it is for weighing sugar and flour, that we would have saved ourselves a great deal of unnecessary trouble.

MR. FINLAY.—Mr. Taylor makes other grave errors. The standards of measurement, the English inch, and other dimensions, are arbitrary and empirical, and not established by any fixed method of verification.

MR. GOOD.—Dr. Menninger has pointed out very lengthily inconsistencies of this paper, which occur to one in listening to it, but the other criticism that I would pass on the paper is in regard to the pains that Mr. Taylor takes to prove the convenience of the binary division; the argument is entirely too long to prove that which is so evident to everybody. The unfitness and inconvenience of the decimal system on this point has been pointed out frequently, but that unfitness and inconvenience is more apparent than real. Ten is the natural multiple of the system, and you may divide ten by two. But the division by two cannot be continued with our coin and coinage, nor with our system of weights and measures. 2½ is just as convenient a quantity as two, four or three. In dividing our measures down to minute quantities, we have the half of one, and we can carry this division on to an almost indefinite extent. So while it is not quite so continuous as dividing 64 down, yet it is not so inconvenient as to form an insuperable objection. Of course the conveniences of the metric system in all other respects are conceded.

MR. HALLBERG.—I am also of the opinion that an octonary system would be preferable to the decimal, but that is out of the question. Mr. Taylor has gone to considerable trouble to show the inconvenience of the decimal notation, but he has forgotten to make clear the fact of its great convenience as corresponding to our decimal system of currency. How easy would it be in the buying of preparations, say at $8.75 a dozen, the dozen being ten, to figure out the price of one, whereas now the calculation entails complication, is annoying sometimes, and so odd that you have to drop a fraction somewhere to get it approximately accurate. So I believe Mr. Taylor ought to put forth the advantages a little more, as well as the disadvantages.

MR. LYONS.—As a paper, it is remarkable for its logical development of the subject, if we only look at it as a whole. It is not true that there are really inconsistencies between the first part and the last part of the paper, because the new system that is suggested is not to be adopted until it can be adopted universally, until it can replace the present metric system. I wish, however, to say that there is a weak point in the urging of the octonary system as strongly as it is urged as a practical system opposed to the decimal system. Those who make that argument forget that the octonary system has no three and no five among its fractions, consequently in practice we shall meet the same kind of difficulties, not perhaps as directly but as certainly under that system as we do under the present decimal system. In the decimal system there is practically no fraction. The new system elaborated in this paper involves the octonary system of notation; when that is attained, we are ready for the adoption of this system; unless it is done, the metric system is the only one we can think to ever bring into favor. If any changes are to be made in the system used in pharmacy, let us take the British system with its fluid ounce consistent with the avoirdupois ounce. I propose to wait until the metric system is universally used. By the way, all the United States coast surveys which were formerly made in feet and inches are now made by the metric system.

MR. HECHLER.—The very first part of this paper is devoted to a Chinese argument. In other words, Mr. Taylor is opposed to progress because it is difficult to progress. That is the summing up of it, it seems to me. And he enters into a proposition as to how difficult it would be to introduce the metric system into the manufactures and the arts. Of course that would have to be overcome. Such values like two, four, eight, and the multiples by two are readily comprehended, while one, three, nine, twenty-one, eighty-one, leave the mind rather confused. Why? Because the mind cannot handle the multiplication of threes as well as it can the multiplication of twos; that is the only reason. So there is no argument in that at all. In other words, Mr. Taylor accuses mankind of not being well up in the multiplication table, it seems to me. Another point in the paper, and one which Mr. Menninger has called attention to, is the complexity urged against the metric system; and while thus arguing he introduces more, and lastly, after quoting John Quincy Adams, and going back into the nation's history, he says we do not want anything of the kind; but look at what we had then and what we have now. Ever since the metric system has been proposed, there has been opposition to it. Still, in the scientific circles, it marches on. Germany has come to the metric system; it is used in her analytical work, and by her great scholars, John Quincy Adams to the contrary notwithstanding. Analytical chemistry uses the metric system, and if it would involve difficulty, trouble, and complexities, analysts would hesitate before adopting it.

MR. GOOD.—The point was made very forcibly, that it is necessary for every scientific man to acquaint himself with the metric system, since it is the language of science at present. The difficulty in the introduction of the metric system lies in our close relationships to other nations; we depend upon Great Britain to a great extent, and we do not want to do anything that would make intercourse with her more difficult. It is the impenetrability of the British mind which makes it difficult to introduce this system of weights and measures. To illustrate that, I am going to repeat an anecdote which was told by a gentleman at the late Convention of the Wholesale Druggists. He said when he came over, as they were nearing the shore, looking through a glass they saw trees. In handing the glass to his boy, he said to him, "Johnny, get on to those trees." Then an Englishman turned around and said, "Will the Captain stop long enough for us to get on to those trees?" [Applause.]

C. S. Hallberg, under instructions from the Illinois State Pharmaceutical Association, offered the following resolution:

Resolved, That it is the sense of this Association that in the revision of the U. S. Pharmacopœia of 1890, the parts-by-weight system be replaced by the weight-and-volume system; that the decimal proportions be retained, so as to harmonize with the metric system; and that relative quantities be also expressed in troy weight and U. S. wine measure.

On motion of Mr. Painter, and with the consent of Mr. Hallberg, the resolution was laid on the table for future action.

The Chair appointed Messrs. Remington, Painter, Trimble and Judge a Committee to assist the Chairman in the preparation of queries.

The Section then adjourned until three o'clock.

THURSDAY AFTERNOON, SEPTEMBER 8TH.

The Section was called to order at 3:15 p. m. by the chairman. Mr. Sloan read a paper by Joseph Feil on "Ground Ointment Medicaments."

GROUND OINTMENT MEDICAMENTS.

BY JOSEPH FEIL, PH. G.

Who in the daily round of prescriptional duties has not hoped, desired and prayed for easier methods in making ointments? We claim to be progressive, and yet we follow the same method of making unctious preparations as were practiced by Galen, and may be a thousand years before his time.

The innovation I propose has nothing startling about it, nor will it tend to increase expenses; in fact, it should reduce them.

What we want is ground ointment medicaments, so that we can almost instantly mix them with our ointment bases, save time, and have much handsomer-looking preparations.

We know the main difficulty in making this class of galenicals lies in getting the medicament in a very fine state of division; this is a laborious, time-taking operation, and time, at least with some pharmacists, is money. Now what I propose is, let the pharmacist get a small paint-mill, and proceed as mentioned further on, or induce our ever-willing-to-accommodate-us friends, the ubiquitous manufacturing chemists, to put on the market a line of ground ointment medicaments such as zinc oxide, lead carbonate, yellow and red mercuric oxide, ammoniated mercury, etc., etc., ground in benzoinated cotton-seed oil.

The value of this base for the purpose is that less is required than if a more solid one is used; its practical tendency to rancidity or other form of decomposition is *nil*, and it requires only one-fifth the weight of the chemical to get it in proper condition for use; that is to say, for example, if it were desired to make five ounces zinc oxide ointment for the one ounce zinc salt, one and one-fifth ounces of the ground preparation would be required, and then sufficient of the required base to make five ounces.

These ground medicaments could be put on the market in collapsible tubes containing two or four ounces each, or half and one-pound patent painters' cans; the cost of grinding would be small, and the saving to the pharmacist in time would be great; besides, an ointment made from such ground chemical or drug would certainly be better and smoother than any the pharmacist could make from ordinary drugs used for this purpose as found in the open market.

Cleveland, Ohio.

MR. REMINGTON.—I hoped that some one else would direct attention to the line of argument that a very efficient ointment cannot be made by the process of the Pharmacopœia. I know it can be made if a sufficient amount of labor is expended. The making of an ointment is one of the simplest pharmaceutical operations, and all tendency to rancidity can be avoided by making them up extemporaneously as they are wanted.

MR. HALLBERG.—Prof. Remington is right, and I do not like this Association to accept a paper of that kind and print it in the Proceedings. I think that it is vicious in its character. It seems as though the author wanted to put the drug business in such a shape that a grocer could make an ointment on a prescription. I for one would not like to see the paper printed in the Proceedings.

MR. PAINTER.—The author thinks it may be an improvement.

MR. HALLBERG.—It is in direct contradiction with everything that has been said here this morning.

MR. SLOAN.—Every man has a right to his thoughts.

MR. PAINTER.—All are not represented here, and he may represent a large number who have different views.

MR. HALLBERG.—I know Mr. Feil is a practical pharmacist, but I believe that he has not given due consideration to this subject.

MR. GOOD.—There are no ethical objections.

MR. HALLBERG.—Serious ethical objections against proprietary articles were advanced this morning, and here are advocates of them.

MR. SLOAN.—I think there has been a misapprehension. The author suggests that if the individual does not care to provide himself with a powder-mill for grinding these materials into a fine condition, he can have it done for him by a manufacturer; he does not propose to make a proprietary article of it.

The following two papers by Joseph Feil were also read and referred.

BISMUTH AND POTASSIUM CITRATE.

BY JOSEPH FEIL, PH. G.

Whether soluble bismuth salts possess the therapeutic value of the insoluble salts or not, the fact is evident that such a soluble compound has been used for a sufficient length of time to prove at least by its continued and somewhat increased demand that it possesses some valuable and positive medicinal value.

The objections to the bismuth and ammonium citrate are its aptness to lose ammonia, and hence to be rendered somewhat insoluble, and the still greater one of requiring an excess of aqua ammonia to keep it in solution, and hence rendering medicinal substances requiring a neutral or acid solution, and usually combined with this remedy, inert, or throwing them out of solution altogether.

With the purpose of discovering some bismuth salt which shall be soluble in water, neutral to test paper, not precipitated by acid or alkali, and easily to be used with pepsin, pancreatin and alkaloids, I have instituted some two hundred experiments.

It would be soul-wearying to again go over the ground once traversed, although infinitely easier on paper than at the laboratory table, but it would also serve no purpose; the conclusion of the work is, however, I modestly may expect, of some value to chemistry and pharmacy.

I searched every available chemical work in two large libraries, and I found no reference to such a bismuth salt as I desired to have. It was astonishing that recent chemical works, such as Roscoe and Schoelemmer and others do not even mention bismuth and ammonium citrate.

After very many experimental failures, I finally found that bismuth citrate is soluble to a very appreciable extent in potassium citrate solution.

I can state that two parts bismuth citrate and five parts potassium citrate will make a clear solution with twenty parts water with the aid of a gentle heat; this solution will retain its clearness for several days, when a deposit of perhaps one-eighth of the mixed salts takes place, and the remainder remains in solution indefinitely; when about one-third glycerin is used in place of so much water, only one-half the amount of deposit takes place, or one-sixteenth of the salts used; I have not yet definitely determined the nature of this precipitate, the solution shows on testing a considerable percentage of bismuth salt yet in solution, however, the deposit shows a larger amount of bismuth salt than two-sevenths, the proportion used; the solution is not affected by the addition of ordinary acid, alkaline or alkaloidal solutions.

The work required was so much greater than I anticipated, that I could not complete my experimentation.

The above salt was used in several cases by a Cleveland physician, and he found about the same action as from the Pharmacopœial bismuth and ammonium citrate.

Cleveland, Ohio.

SOLIXIRS.

BY JOSEPH FEIL, PH.G.

The elixir question is not yet settled; that there is a continued demand for certain kinds is a fact recognized everywhere, and another fact equally as well recognized is that as few kinds as possible are desirable for the pharmacist to keep in stock.

With a view to partially solving the problem, I propose a new class of preparations to be known as SOLIXIRS, in other words, solutions for making elixirs; but not in the sense in which the manufacturing chemists have attempted to supply this demand during the past few years, but rather from the standpoint of what is absolutely needed by the retailer, and what, if he is not too lazy, he can make for himself.

The underlying idea is to have in solixirs, of the mostly-used medicaments for making elixirs, such strength of solution and condition that to make any stated standard elixir, it will be necessary to simply mix certain quantities together, and add simple elixir to make the required quantity.

I do not expect to either exhaust the subject or say even all that can be said on the idea, but only to indicate a new means towards a very desirable end.

The solixirs I wish to comment on at present are those of bismuth, cinchona, quinine, cinchonidine, strychnine, licorice, pepsin, cinchona alkaloid, the pyrophosphate and phosphate of iron and cinchonine.

Solixir Bismuth.

Bismuth and ammonium citrate	℥j.
Glycerin	f℥iss.
Water	f℥iss.

Mix and add aqua ammoniæ sufficient to make a clear solution, then add water to make f℥iv.

NOTE.—It is highly probable that the new salt I have mentioned in another paper, namely bismuth and potassium citrate, will, after fully determining all its properties, prove of far greater value than the above, as it can be mixed with either alkaline, acid or neutral mixtures without precipitation.

Solixir Quinine.

Quinine hydrochlorate	℥j.
Alcohol to make	f℥iv.

Mix.

Note.—This solixir will mix with aqueous solutions without precipitating.

Solixir Cinchonidine.

Cinchonidine hydrochlorate	℥j.
Alcohol to make	f℥iv.

Mix.

See note to Solixir Quinine.

Solixir Cinchonine.

Cinchonine hydrochlorate	℥j.
Alcohol to make	f℥iv.

Mix.

See note to Solixir Quinine.

Solixir Cinchona.

Fluid extract cinchona, from prime bark	f℥iv.
Diluted sulphuric acid 1 in 20.	Weak alcohol solution, of each sufficient, containing 1 part of alcohol to 3 of water by measure.
Solution sodium hydroxide, 1 in 20.	
Hydrochloric acid.	

Evaporate the fluid extract until it is free from alcohol, make a solution of the residue with the diluted sulphuric acid, filter, precipitate the alkaloids with the solution sodium hydroxide, wash with the smallest possible amount of water, shake precipitate with f.℥iij. weak alcohol solution, add just enough hydrochloric acid to make a clear solution, then add enough weak alcohol solution to make f.℥iv.

Note.—Made in this manner the solixir cinchona represents the full alkaloidal strength of the bark ; minim for grain. The process usually followed of detannating fluid extract or tincture of cinchona is open to the objection that the alkaloids to some extent probably form insoluble ferrates, and furthermore it has never been proved that by the method usually followed in detannating the resulting preparation contains all or even a fair quantity of the alkaloids in the original preparation.

Solixir Cinchona Alkaloids.

Quinine hydrochlorate	gr.clx.
Cinchonidine hydrochlorate	gr.clx.
Cinchonine hydrochlorate	gr.clx.
Alcohol to make	f℥iv.

Mix. (See note to Solixir Quinine.)

Solixir Pepsin.

Pepsin of good quality	℥j.
Glycerin	f℥iss.
Water	f℥iss.

Mix and add hydrochloric acid, the smallest quantity necessary to make nearly a clear solution, then add water to make f.℥iv., and filter.

Solixir Licorice.

Ext. licorice, any good *foreign* brand	℥j.
Glycerin	f℥iss.
Water to make	f℥iv.

Mix, and dissolve by maceration and frequent agitation, then filter.

NOTE.—The good foreign brands of licorice contain only one-half the amount of glycyrrhizin found in American brands, but the flavor and taste are far superior and hence more desirable for elixir purposes.

Solixir Strychnine.

Strychnine sulphate	gr.iv.
Alcohol	f℥j.
Water to make	f℥iv.

Mix and dissolve, then color with tincture cudbear, 1 in 8, dil. alc., f.ʒj.

Mix.

Solixir Iron Pyrophosphate.

Iron pyrophosphate	℥j.
Glycerin	f℥ iss.
Water to make	f℥ iv.

Mix, and add aqua ammonia to exact neutrality.

Solixir Iron Phosphate.

Iron phosphate	℥j.
Glycerin	f℥ iss.
Water to make	f℥ iv.

Mix and add aqua ammonia to exact neutrality.

Solixirs of many other drugs and chemicals can be made on the same general principles as the above formulas.

As an example of what can be done with the above, I quote:

Elixir Pyrophosphate Iron, Quinine, and Strychnine.

Solixir quinine.	
Solixir strychnine	aa f℥i.
Solixir pyrophosphate	f℥ij.
Simple elixir to make	Oj.

Mix.

Cleveland, Ohio.

The following paper was read next:

THE PERCENTAGE OF ETHYL NITRITE IN THE WASHED NITROUS ETHER OF THE PHARMACOPŒIAL PROCESS FOR SPIRIT OF NITROUS ETHER.

BY W. SIMONSON.

The Pharmacopœia directs that its spirit of nitrous ether shall contain 5 per cent. of the crude ether obtained by its process, and shall show, by an assay method given, at least 4 per cent. of absolute ethyl nitrite. In other words, it states that this impure ether contains at least 80 per cent. of pure nitrite.

It has been shown by Parsons that this washed ether contains ethyl acetate as well as nitrite. The proportions, theoretically, are 63 per cent. ethyl nitrite, and 37 per cent. ethyl acetate, and he states (N. R., Sept. 1883, p. 259) that "careful quantitative experiments give results quite closely in accord with this supposition."

In a paper read before the O. P. A. meeting at Springfield, 1886, this operator showed that the commercial concentrated nitrous ether, except one make of 90 per cent. (certainly not U. S. P.), and one which was so poor as to be worthless even when considered as a spirit, varied between 59 per cent. and 28 per cent. total nitrites stated as ethyl nitrite. These varying results, facing the statement of Parsons that the process yields a product of quite constant composition, and failure after some search to find any published statements on the percentage of nitrite in the washed ether, have prompted the present work. The difference between the product required by the Pharmacopœia and that obtained by its process, is becoming generally well known and has proven a source of trouble between manufacturers and those consumers who aim to maintain the officinal standard. Hence it is very desirable that the error should be corrected at the next revision. With the purpose of supplying data for such a change, application was made to all makers of the concentrated nitrous ether, whose product seemed to be made by the U. S. P. method. One replied, refusing to furnish material under any condition, and from others no answer was obtained, except one who was interested in the subject. From this one manufacturer, and from another who makes and sells the spirit, but not the ether, supplies were finally obtained. The latter furnished the first twenty five in the following table. All these were assayed while but recently made, and nearly free from acid. The last fifteen were prepared in October 1886, and examined August 15, following. These samples were the washed distillate after dilution with an equal weight of alcohol, so that the figures for percentage strength must be doubled. At request of the maker, the total acids in these were estimated and stated as nitrous acid, HNO_2. As specimens were preserved by an equal quantity of alcohol, they were in much better quality than the undiluted ether at the same age, though containing an average of 3.2 per cent. acids, as nitrous acid.

The method of assay for nitrites is that of Allen, measurement of NO evolved from a mixture of a known quantity of the ether to be tested with a strong solution of potassium iodide and a dilute acid. The correction for solubility is 0.3 cc. NO for each 10 cc. of liquid in the nitrometer tube.

No.	Per Cent Nitrites as $C_2H_5NO_2$	Per Cent. Nitrites in Unwashed Ether.	Loss by Rewashing.		Per cent. Total Acids as HNO_2.
			Volume.	Weight of $C_2H_5NO_2$.	
1	28.8	43.9	36 per cent.	2.5 per cent.	
2	30.8	57.5	50 "	7.0 "	
3	30.2	39.9	28 "	5.0 "	
4	39.3	45.2	22 "	10.0 "	
5	45.8	67.1	34 "	3.5 "	
6	38.7	51.0	29 "	7.0 "	
7	41.0	67.8	43 "	6.0 "	
8	42.8	68.1	40 "	5.0 "	
9	59.4	71.4	21 "	5.0 "	
10	40.8	56.5	30 "	3.0 "	
11	44.6	69.4	36 "	1.0 "	
12	50.4	58.0	17 "	4.0 "	
13	52.4	70.0	28 "	4.0 "	
14	38.9	53.6	29 "	3.0 "	
15	48.5	67.8	30 "	2.5 "	
16	61.1	77.0	23 "	3.0 "	
17	43.0	68.0	37 "	2.0 "	
18	45.3	63.3	32 "	4.0 "	
19	43.3	55.8	25 "	4.0 "	
20	41.8	52.6	22 "	2.0 "	
21	45.8	69.7	39 "	7.5 "	
22	23.0	33.4	33 "	2.5 "	
23	38.0	61.0	40 "	3.5 "	
24	34.8	57.9	43 "	5.0 "	
25	32.0	43.4	33 "	8.5 "	
26	37.2	63.1	47 "	9.0 "	1.95
27	21.75	39.6	52 "	12.5 "	4.3
28	33.90	63.7	52.5 "	2.0 "	2.0
29	18.55	33.5	54.5 "	17.0 "	4.3
30	21.0	38.6	52 "	11.5 "	4.6
31	22.6	38.5	54 "	21.5 "	4.2
32	37.9	64.5	46 "	8.0 "	2.0
33	35.9	64.3	45 "	2.0 "	1.9
34	35.2	60.6	49 "	11.5 "	2.0
35	20.7	37.4	52 "	13.5 "	6.4
36	19.8	35.7	54 "	17.0 "	4.1
37	33.55	61.8	47 "	2.0 "	1.9
38	21.7	38.8	53 "	16.0 "	4.2
39	37.75	64.1	46 "	7.5 "	1.8
40	32.55	61.0	47 "	2.0 "	1.8

The percentages of total acids, in terms of nitrous acid, were found by titrating very rapidly with deci-normal alkali from one to two grams in about 30.0 cc. alcohol. The quantities stated in the table are the lowest that could be obtained in three estimations of each specimen, the experimental error rarely exceeding 0.1 per cent. The operation is attended with some difficulty. Using a 5 per cent. dilution and deci-normal alkali, with phenolphtalein as indicator, a point is soon reached, alkali being added rapidly, where the liquid is fairly pink throughout, very quickly fading. A further small addition of alkali renews the color, now fading more slowly, to be re-formed by a still smaller quantity of alkali, and these reactions may be kept up for some time, the end-reaction vanishing. The color also fades, that is, alkali is consumed, even if in large excess, in absence of air, though more rapidly if exposed, doubtless through saponifying of ethyl nitrite, as well as formation of more free acid. In making assays, as alkali may be consumed through these two causes, thus increasing unjustly the calculated amount of free acid, the end reaction has been taken as that point at which, alkali being added very rapidly, the pink color persists a moment after shaking. As the results have not been checked by any other method, they may be held as only approximate.

Of the first series, variation is from 23 to 61.1 per cent., or as 1 to 2.66, average being 41.6 per cent. The portion soluble in an equal quantity of water was from 17 to 50 per cent., but loss by re-washing was usually very small. Of the second, figures doubled on account of previous dilution of specimens, it is from 37.1 to 75.8 per cent., or as 1 to 2.04. The portion soluble in water is mostly alcohol, causing, with exception, a large loss of ethyl nitrite by re-washing.

These are the variations found in a year's production in one factory, and in a month's in another. They are believed to cover variations that might be found in a much larger number of specimens and from more sources. If the proportion of ethyl nitrite is the chief indication of medicinal value, these variations are too great, and form a subject for due consideration. Either the process must be modified in some of its details, or final dilution be based on assay of the washed ether. Did the value of the spirit depend solely on ethyl nitrite, then the method might well be replaced by that detailed by Prof. Painter at last year's meeting. This operator has had no experience with this process in making this ether, but has repeatedly obtained a nearly pure nitrite in converting amyl alcohol.

Cincinnati, August 22, 1887.

MR. LLOYD.—The paper does not show the amount of labor bestowed upon it in comparing the various processes. The amount of ethyl nitrite present in the crude ether varies considerably, as is shown by the table; and on standing for some time that amount is decreased very materially. Made according to the Pharmacopœial process, the spirit of nitrous ether must vary to some extent, and after some time only a small amount of nitrite of ethyl can be present.

MR. PAINTER.—I have a sample of nitrous ether from my experiments made last year, that I claim to be almost pure nitrous ether. This sample has been standing over carbonate of sodium. I am satisfied from the appearance there has been no change. I am willing to submit it to any one for analysis.

MR. LYONS.—I have not been able to attend very closely to what was said here just now. My experience in the assay of preparations containing nitrous ether has been that there was a very rapid deterioration—a very rapid loss of nitrite, as described in this paper. By the method of A. H. Allen I have prepared five per cent. solutions, and, leaving them in bottles half full, assayed them at intervals of a few days, with the result of finding a decrease within three or four weeks' time, to less than half the strength of the original mixture. There was a paper presented at a late meeting of the Michigan State Pharmaceutical Association that gave results corresponding, I think, with these figures, showing that the concentrated ether made by the U. S. P. process is very variable in strength, and that these preparations rapidly lose their strength with age.

The following letter from J. B. Bond was read:

LITTLE ROCK, ARKANSAS, *September* 5, 1887.

"TO THE AMERICAN PHARMACEUTICAL ASSOCIATION:

"After presenting my compliments to my brethren in Council assembled, and regretting my inability to meet with them, I beg to be allowed to be heard, very briefly, on two points of great interest to all practical manufacturing and dispensing pharmacists. I believe I voice the sentiments of a majority of the profession on the points referred to.

"First, take positive and final action, if possible, upon the question of retaining the use of measures of capacity for liquids, as has been the long and uniform practice of English and American pharmacists. All liquid formulæ can be constructed to correspond to those of parts by weight by sufficiently increasing or decreasing the fluid measure of the heavier or lighter liquid. Practising pharmacists find it more convenient to measure liquids by any system of measures, either in manufacturing or dispensing, than to weigh them.

"This brings me to my second suggestion: Take no step looking to the divorcement of the manufacturing and dispensing branches of our profession so far as the officinal preparations proper to be made in our own laboratories is concerned. The number of physicians who find cases to fit certain proprietary prescriptions, and the number of so-called 'pharmacists' who are mere traders in ready-made bottled and wrapped medicines, is alarmingly large. Soon our functions as skillful dispensers will be relegated to the corner groceryman, unless something be done to avert the growing evil of ready-made prescriptions. To this end recognize the practising pharmacist in your elective officers.

"Give us liquid measures for our manufacturing processes, and working men for officers.

(Signed) "JOHN B. BOND."

The following report, referred to the Scientific Section by vote of Council, was read:

At the Providence meeting Prof. Painter offered a resolution, which was referred to the Council for consideration—

Resolved, That the Committee on Papers and Queries be authorized and empowered to have all papers presented to the Association printed before being read, and that printed copies of each paper be circulated amongst the members prior to the time of reading the paper.

In order to arrive at a fair understanding of the merits involved in this question, it is proper to refer to the policy of the Association in the past. At the meeting held in New York in 1860 (see Proceedings 1860, p. 44), the following resolution was adopted:

Resolved, That this Association will not accept any report or scientific paper, written by a member or contributed by one not a member, which has been previously printed and distributed.

Under this resolution papers have been refused by the Association.

At that period and for a number of years afterward, the Association did not permit the printing and publication of any paper before the Proceedings were ready for distribution. In 1873 the Permanent Secretary and the retiring President, Ebert, both recommended (see Proceedings 1873, pp. 42 and 47), that permission be given to authors for publishing their papers in a journal previous to the appearance of the Proceedings. The Committee appointed to consider these and other propositions reported (ibid., p. 80), "that in their opinion the publication in advance of the papers presented to this Association, would deprive our Transactions of much of their value, and they would not be so well appreciated by our own members, nor sought for by those who do not belong to our Association; if, however, any author of a paper should request its publication in a journal, previous to the issuing of the Proceedings, we would leave the matter discretionary with the Executive Committee."

After a lengthy discussion (ibid., pp. 82-84), the report was amended by striking out the last sentence, and the prohibition against the publication of papers in advance of the Proceedings was thus continued.

In the following year the Permanent Secretary again referred to this matter (Proceedings 1874, p. 470), and a Committee was afterwards appointed (ibid., pp. 519, 521), to take the subject into consideration and report at the next annual meeting. An elaborate report was presented and thoroughly discussed (Proceedings 1875, pp. 790-795), resulting in the adoption of the following resolution:

Resolved, That when authors of scientific papers have prepared copies or abstracts of their essays previous to the meeting of the Association, they shall be at liberty to distribute such copies or abstracts at any time subsequent to the official reading of their respective papers; provided that the papers are always headed in publication by the statement that they have been read at our meeting.

No further action has been taken by the Association, but in the course of time this last resolution has been frequently disregarded in so far as, before the meeting, papers were put in type for publication in one or more journals; the original manuscript was either not presented at all or in a mutilated condition, and papers were sometimes missing from the custody of the proper Committee. A Committee was then appointed by the Council (Proceedings 1883, p. 419), to confer with the Chairman of the Committee on Papers and Queries for the purpose of devising a plan for the protection of the papers belonging to the Association. Since then a Committee was appointed at the subsequent meetings, in conformity with the following resolution (ibid., p. 472):

Resolved, That hereafter a Committee be appointed, consisting of three members of the Council who are not connected with the publication of any pharmaceutical journal, said committee to take charge of all papers read before the Association, and when called upon, to furnish copies for publication at the cost of copying the same.

The proposition to place printed copies of papers, before being read, into the hands of every member present at the session, can only be carried out by having all, or nearly all, the papers printed before the meeting takes place, for the Committee on Papers and Queries can scarcely be expected to devote the necessary time and labor to this kind of work during the intervals between the sessions.

The cost to the Association is likewise to be considered. During the five years 1871–1875 the papers presented—not including the reports of Committees—covered 719 printed pages in the Proceedings, the smallest number (120) being in 1874, and the largest number (180) in 1875; the average for each year during this period was 144 pages. During the last five years, 1882–1886, the papers covered only 448 pages, a yearly average of 89⅗ pages, the smallest number (73) being in 1882, and the largest namber (113) in 1885. It is not the purpose to inquire into the causes that have led to the falling off of 37¾ per cent.—as far as space is concerned—in the papers read before this Association, but to show that in addition to the labor a considerable expenditure would be annually required. Though the prices for printing will obviously vary in different localities, the cost will certainly be from $1 to $1.50 per page, making an average annual expense of between $90 and $145, calculating on the last five years' average, or from $144 to $216 on the five years' average of twelve years ago. Such an expense should probably not be considered too large, if accompanied by corresponding advantages. But will this be the case?

It is thought that studying is best accomplished in the quietness of our room or laboratory, but in a large assembly we should at most expect merely incitements and impulses to further studies. It is likewise thought to be far better and more profitable to listen attentively to a discourse or lecture than to follow the lecturer by means of a manuscript or printed copy.

The opinion of the Committee on Publication is decidedly against the proposed plan, but they are in favor of a modification of it, as follows:

Chap. VII., Art. IV., of the By-Laws provides that any member writing a paper for the Association must, to insure its publication in the Proceedings, refer the same, *with a synopsis of its contents*, to the Committee on Papers and Queries previous to the third session.

In the past the requirements to furnish a *synopsis of contents* of a paper has not frequently been complied with, but this it would seem is really all that is required to enable the listener to intelligently discuss a paper which he may have heard read, and therefore the Committee propose to amend the proposition by offering the following substitute for it:

Resolved, That the Committee on Papers and Queries be authorized and empowered to have a synopsis of every paper presented to the Association printed, and that printed copies of such synopsis be circulated amongst the members prior to the time of reading the paper.

The Committee believe that in this way the good aimed at in the original resolution will be accomplished, without detracting from the attention to the author; that the cost of printing will thus be reduced to a small figure, and that the printing can be done during the time of the meeting without entailing arduous labor upon the chairman of the Committee on Papers.

The members of the Committee on Publication are aware that authors sometimes find it difficult to give in comparatively few words the course of reasoning that may have led to certain researches, or to state briefly the main results which have been obtained, but it is believed that this may be accomplished. The Committee may be pardoned for mentioning in this connection that an excellent synopsis was handed in, among others, with the paper entitled "Ginger in Soluble Essence," which was presented by Mr. L. P. Stevens, of Brooklyn, at the meeting in Providence.

C. LEWIS DIEHL,
H. J. MENNINGER,
JOHN M. MAISCH.

After some discussion, it was, on motion of Mr. Whelpley,

Resolved, That the Section recommend the Association to have the scientific papers, accepted by the Committee, printed by the Association printer, in the type in which they are to appear in the Proceedings, and a sufficient number of copies struck off previous to the meeting to supply the members who may be in attendance.

Mr. Painter called up the following resolution from the Illinois Pharmaceutical Association:

Resolved, That it is the sense of this Association that in the revision of the U. S. P. of 1890 the parts-by-weight system be replaced by weight-and-volume system; that a decimal proportion be retained, so as to harmonize with the metric system, and that relative quantities be also expressed in troy weights and U. S. wine measures.

On motion of Mr. Sheppard, the resolution was referred to the Committee on the Revision of the U. S. Pharmacopœia.

On motion of Mr. Whelpley, a vote of thanks was tendered the retiring Committee on Papers and Queries for the able and efficient manner in which its work had been conducted.

On motion of Mr. Remington, the Section adjourned.

A. B. LYONS,
Secretary Section on Scientific Papers.

MINUTES

OF THE

SECTION ON PHARMACEUTICAL EDUCATION.

THURSDAY AFTERNOON, SEPTEMBER 8, 1887.

Vice-President Simmon in the chair.

Mr. Remington nominated Mr. John F. Judge to be chairman of Section on Pharmaceutical Education.

Mr. Holmes asked unanimous consent to request the Permanent Secretary to deposit an affirmative ballot for Mr. Judge. Carried, and Mr. Judge was elected chairman.

Nominations for Secretary being in order, Messrs. A. B. Stevens, of Ann Arbor, and H. M. Whelpley, of St. Louis, were nominated. Mr. Stevens withdrew, and Mr. Remington moved that the chair deposit an affirmative ballot for Mr. Whelpley. The motion was carried, and Mr. Whelpley was elected.

Mr. Judge, in taking his seat, said:

GENTLEMEN, I thank you sincerely for the compliment of electing me to preside over the deliberations of this Section. I trust any shortcomings of mine that may be noticed will be attributed to the head, and not the heart. I solicit the assistance of all the members in presiding over your deliberations. Again I thank you.

Mr. Remington then explained the objects of this Section, and stated that it was not the intention to introduce any discussion at this session, but to simply organize and be ready for business next year, the subjects for discussion and such business as may be brought before the Section to be arranged beforehand by the Committee.

The chairman then announced the names of P. W. Bedford and H. M. Whelpley to constitute, with the chairman, the Committee on Education. Mr. Bedford desired to be relieved from serving on that committee, but by vote of the Section his name was retained.

On motion of Mr. Remington, the Section then adjourned.

H. M. WHELPLEY,
Secretary Section on Pharmaceutical Education.

MINUTES

OF THE

SECTION ON PHARMACEUTICAL LEGISLATION.

THURSDAY AFTERNOON, SEPTEMBER 8, 1887.

The Section on Pharmaceutical Legislation organized during the eighth Session by the election of Mr. R. F. Bryant, of Kansas, as Chairman, and William P. DeForest, of Brooklyn, N. Y., as Secretary.

Mr. Bryant, on taking his seat, said :

> Gentlemen, I desire to thank you for the honor you have conferred upon me by electing me the chairman of this Section, and in aiming to discharge the duties as Chairman I hope you will overlook any errors or mistakes I may make. Again I thank you.

The following committee was elected under Article 10 of the By-laws : R. F. Bryant, Kansas ; J. M. Maisch, Pennsylvania ; W. P. DeForest, New York.

Mr. Day, of Illinois, moved that "a committee of five be appointed by the chair to devise a plan, if the same be found feasible, for the interchange of certificates by State Boards of Pharmacy."

Carried.

In support of his motion, he stated he had written to every Board of Pharmacy in the country on the subject, and received many answers, most of which were favorable.

The motion was discussed by

Mr. Rogers, of Kentucky, who explained that his Board issued two grades of certificates, one of which required 66⅔ per cent., the other 75 per eent., but would only recognize one kind issued by other Boards.

Mr. Brown, of Kansas, spoke of the necessity of co-operation, to arrange the various pharmacy laws and make them uniform. He thought it necessary to confer with State Associations for that purpose.

Mr. Baker, of Virginia, explained why two delegates were not present from his Board.

Mr. Canning, of Massachusetts, and several other members, took part in the discussion, which was closed by Mr. Day explaining the necessity for the interchange of cetificates, which was that clerks from other States would not have to wait three or six months for examination if they could be received by certificate.

The motion was then carried unanimously, and Mr. Remington, of Pa., moved the chairman be granted time until after the Section adjourned, to appoint the committee.[1]

Carried.

Mr. Nicot, of Brooklyn, moved that a record be made for information of the Boards of Pharmacy represented at this session.

Carried.

List of Boards of Pharmacy represented at the session of the Section on Pharmaceutical Legislation, September 8, 1887:

S. E. Parkill,	Michigan.
Geo. McDonald,	"
J. W. Thomas,	Virginia.
T. R. Baker,	"
C. W. Day,	Illinois.
A. E. Ebert,	"
Jno. A. Nipgen,	Ohio.
E. M. Hatton,	"
John Weyer,	"
W. Rogers,	Kentucky.
R. J. Synder,	"
A. Conrad,	Wisconsin.
A. H. Hollister,	"
P. W. Bedford,	N. Y. City.
Alonzo Robbins,	Pennsylvania.
Geo. H. Schafer,	Iowa.
W. P. De Forest,	Kings County.
L. E. Nicot,	"

Mr. Eliel, of Indiana, thought that members from States having no Boards of Pharmacy are not represented or interested in this Section, and wished to call attention to his own State. Attention of the members was drawn to the fact that the consideration of Boards of Pharmacy is not the only business of this Section, as all other legislation affecting druggists was part of it also, and that members from States having no pharmacy laws would become interested and made to work still harder for their passage.

Mr. Cushman, of Florida, stated his State had a pharmacy law, but it was not obtained through the Pharmaceutical Association. It required the examination of druggists by three physicians from a regular medical college. The State Pharmaceutical Association, however, proposed to get a law soon that would better represent the pharmaceutical profession.

Mr. Carraway, of Tennessee, thought something should be done to prevent men who had failed in examination in other States from coming to Tennessee.

Mrs. Rosa Upson spoke of the law in her State.

Mr. Day, of Illinois, presented the following query for discussion next year:

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[1] The following is the committee appointed by the Chairman:

C. W. Day,	Illinois.
L. E. Nicot,	New York.
G. H. Schafer,	Iowa.
G. McDonald,	Michigan.
E. M. Hatton,	Ohio.

"Should the diplomas of Colleges of Pharmacy entitle holders to registration without examination?"

Mr. Hallberg, of Illinois, presented the following query to be discussed next year:

"Give an outline of a pharmacy law embodying all desirable features."

The Section then adjourned.

R. F. Bryant, *Chairman*,
W. P. De Forest, *Secretary*.

APPENDIX.

ALPHABETICAL LIST OF THE NAMES OF MEMBERS FROM WHOM MONEY HAS BEEN RECEIVED FOR ANNUAL DUES, MEMBERSHIP FEES, OR CERTIFICATES, PREVIOUS TO JULY 1, 1887.

	Annual Dues.	Membership Fees.	Certificates.
Abbott, Frank '87	$5 00		
Ahlbrant, Henry E. '87	5 00		
Aimar, C. P. '86	5 00		
Alexander, M. W. '87	5 00		
Allen, E. Floyd '86-87	10 00		
Aman, Henry '87	5 00		
Andrews, J. H. '87	5 00		
Andriessen, Hugo '86-87	10 00		
Angney, J. R. '86	5 00		
Armor, Alpheus '86-87	10 00		
Armstrong, A. M. '86-87	10 00		
Asplin, John H. '84-85-86	15 00		
Atwood, H. W. '86-87	10 00		
Atwood, Luther L. '84-85-86	15 00		
Babo, Leopold '87	5 00		
Bailey, Frederick '87	5 00		
Bain, A. W. '86-87	10 00		
Baker, Edwin '87	5 00		
Baker, T. Roberts '87	5 00		
Baker, W. T. '86	5 00		
Ball, Charles E. '87	5 00		
Ballard, John W. '87	5 00		
Balluff, Paul '86-87	10 00		
Balser, Gustavus '86-87	10 00		
Baltzly, Z. T. '87	5 00		
Bartells, George C. 86-'87	10 00		
Bartlet, W. W. '86	5 00		
Bassett, C. H. '87	5 00		
Bassett, J. W. '86	5 00		
Bassett, Joseph '87	5 00		
Bauer, L. G. '85-86	10 00		
Baur, Jacob '87	5 00		
Bayley, A. R. '87	5 00		
Baylis, L. F. '87	5 00		
Bechmann, C. R. '87	5 00		
Becker, Charles '85-86	10 00		
Beckett, Fred. A. '87	5 00		
Beckman, O. A. '86	5 00		
Beckwith, E. R. '86	5 00	$5 00	
Beebe, J. W. '83-84	10 00		
Belt, Z. J. '87	5 00		
Bendiner, S. J. '86	5 00		
Benedict, Willis '87	5 00		
Benjamin, J. H. '87	5 00		
Betzler, Jacob '85-86	10 00		
Beyschlag, Chas. '86-87	10 00		
Billings, H. M. '86	5 00		
Bishop, F. M. '87	5 00		
Bissell, E. G. '87	5 00		
Amount carried forward	$335 00	$5 00	
Amount brought forward	$335 00	$5 00	
Bissell, J. G. '87	5 00		
Blair, H. C. '85-86-87	15 00		
Blake, J. E. '87	5 00		
Blank, Alois '87	5 00		
Bocking, Edmund '87	5 00		
Boehm, Solomon '87	5 00		
Boggs, E. L. '87	5 00		
Bohl, Conrad '87	5 00		
Bolles, W. P. '87	5 00		
Borell, H. A. '86	5 00		
Bower, Henry '86	5 00		
Bower, Henry A. '86	5 00		
Boyce, S. F. '87	5 00		
Boyd, G. W. '86	5 00		
Boyden, E. C. '87	5 00		
Boynton, Herschell '85-86	10 00		
Brack, Charles '85-86-87	15 00		
Brackett, Aurick S. '87	5 00		
Brant, E. W. '84-85	10 00		
Brewster, W. J. '87	5 00		
Bristol, C. E. '87	5 00		
Brooks, F. M. '85-86-87	15 00		
Brooks, G. W. '87	5 00		
Broughton, Albert J. '84	5 00		
Brown, H. J. '87	5 00		
Bruce, James '84-85-86-87	20 00		
Bruck, P. H. '87	5 00		
Bruguier, Francis '85-86	10 00		
Brunner, N. I. '86	5 00		
Bryant, Wm. C. '86-87	10 00		
Buck, John '87	5 00		
Buck, John L. '87	5 00		
Buffington, C. A. '87	5 00		
Bullock, Charles '86-87	10 00		
Bunker, Elihu '87	5 00		
Buntin, W. C. '85-86	10 00		
Bunting, S. S. '86	5 00		
Burley, E. P. '87	5 00		
Burnham, E. S. '86	5 00		
Burrough, Horace '85-86-87	15 00		
Bury, Edward B. '86	5 00		
Bush, William '87	5 00		
Butler, Freeman H. '87	5 00		
Caffee, A. H. '86	5 00	5 00	
Caldwell, J. W. '86-87	10 00		
Calvert, John '87	5 00		
Campbell, Samuel '85-86	10 00		
Candidus, P. C. '85-86	10 00		
Amount carried forward	$675 00	$10 00	

	Annual Dues.	Membership Fees.	Certificates.
Amount brought forward	$675 00	$10 00	
Carrell, E. A . . . '85-86	10 00		
Carslake, G. M . . . . '87	5 00		
Carter, Solomon . . . '87	5 00		
Caspari, Chas., Jr . '86-87	10 00		
Casper, T. J . . . . . '87	5 00		
Catlin, Ephron . . . . '87	5 00		
Chandler, C. F . . . '86-87	10 00		
Chapin, F. H. . . . . '86	5 00		
Chapin, W. A . . . . '87	5 00		
Choate, John . . . . . '87	5 00		
Christiani, Charles . . '86	5 00		
Clement, H. B . . . '87	5 00		
Cobb, R. L. . . '84-85-86	15 00		
Coblentz, Virgil . . . '87	5 00		
Cole, H. W . . . . . '87	5 00		
Colgan, John . . . . . '86	5 00		
Collins, A. B . . . . . '87	5 00		
Colton, J. B . . . . . '87	5 00		
Conrath, Adam . . . . '87	5 00		
Cook, George E . . . . '87	5 00		
Cook, Gilbert S . . '86-87	10 00	5 00	
Cook, T. P . . . . . '86-87	10 00		
Coon, J. V. D . . . . '86	5 00		
Cornell, E. A. . . . . '86	5 00		
Coumbe, O. H . . . . '86	5 00		
Cowdin, G. H . . . . '87	5 00		
Cowdrey, R. H. . . . '86	5 00		
Cramer, Max . . . . . '87	5 00		
Cressler, C. H . . . . '86	5 00		
Crolius, F. M . . . . '87	5 00		
Cromwell, Z. W . . . '86	5 00		
Crona, S. E. S . . . . '86	5 00		
Crossman, George A . '87	5 00		
Culbreth, D. M. R. '85-86-87	15 00		
Cummings, Theo. F. . '87	5 00		
Curtman, C. O . . . . '87	5 00		
Cutts, F. C., Jr . . . . '87	5 00		
Dadd, John A . . . '87	5 00		
Dalrymple, C. H . '86-87	10 00		
Dana, Edmund, Jr . . '87	5 00		
Darrough, C. H . . '86-87	10 00		
Davenport, B. F . . . '86	5 00		
Davis, Benj . . . . '86-87	10 00		
Davis, E. H . . . . . . '87	5 00		
Davis, W. M . . . . . '87	5 00		
Dawson, E. S., Jr . '86-87	10 00		
Dawson, John Henry . '87	5 00		
Day, Carlos E . . . . '87	5 00		
Dedrick, W. F . . '86-87	10 00		
Deibert, T. J . . . 86-87	10 00		
Denham, C. S . . . . '87	5 00		
Dennin, Chas . . . . '87	5 00		
Dick, Dundas . . . . '87	5 00		
Diehl, C. L . . . . . . '86	5 00		
Ditman, A J. '84-85-86 87	20 00		
Dodd, S W . . . . '85-86	10 00		
Dohme, C. E . . '85-86-87	15 00		
Dohme, Louis . '85-86-87	15 00		
Dolloff, A. S . . '86-87	10 00	5 00	$7 50
Downing, B. F., Jr . . '86	5 00	5 00	5 00
Drake, John R . . . . '87	5 00		
Drake, Jonathan B . . '86	5 00		
Dreher, Louis . . . '83-84	10 00		
Drescher, August . '86-87	10 00	5 00	
Dresser, George E . '86-87	10 00	5 00	5 00
Driggs, C. M . . . '85-86	10 00		
Duble, Jesse B . . . . '86	5 00		
Duckett, W. G . . . . '86	5 00		
Dudley, Oscar E. . '86-87	10 00		
Dunn, John A . . . . '87	5 00		
Durkee, W. C . . . . '87	5 00		
Eareckson, Edwin . '84-85	10 00		
Easton, L. W . . . . '87	5 00		
Eberbach, O . . . . . '87	5 00		
Eccles, R. G . . . . . '87	5 00		
Eckel, A. W . . . . . '86	5 00		
Amount carried forward	$1205 00	$35 00	$17 50

	Annual Dues.	Membership Fees.	Certificates.
Amount brought forward	$1205 00	$35 00	$17 50
Eddy, H. C . . '84-85-86	15 00		
Edwards, N. W . . '84-85	10 00		
Edwards, W F..'85-86-87	15 00		
Eggers. F. H . . . '86-87	10 00		
Eimer, Chas . . . . '86-87	10 00		
Elbe, Constantine B . . '87	5 00		
Elfers, J. C . . . . '86-87	10 00		
Eliel, Leo. . . . . . . '86	5 00		
Elliott, H. A . . '85-86-87	15 00		
Emich, C. V. . . . '86-87	10 00		
England, Robert.'84-85-86	15 00		
Eschmann, F. W. R'86-87	10 00		
Estabrook, H. A. . '86-87	10 00	5 00	
Estes, J. J . . . . . '87	5 00		
Evans, J. S. . . . . '87	5 00		
Fairchild, B. T. '84-85-86-87	20 00		
Feemster, J. H . . '86-87	10 00		
Feil, Joseph . . . . '86-87	10 00		
Fennel, C. T. P . . '86-87	10 00	5 00	
Fink, F. W . . . . '86-87	10 00	5 00	5 00
Finlay, A. K . . . . . '86	5 00		
Fischer, Phil . . . . . '86	5 00		
Fish, Chas. F. . . . '85-86	10 00		
Fisher, Wm. . . '85-86-87	15 00		
Flanagan, Lewis C . . '87	5 00		
Fleck, J. J. . . . . '86-87	10 00		
Foster, W. O . . . . '87	5 00		
Fougera, E C. . . '86-87	10 00		
Fox, D. S.'83-84-85-86-87	25 00		
Frames, J. P . . . . . '87	5 00		
Francis, W. R. . . '86-87	10 00		
Fraser, E. A .'84-85-86-87	20 00		
Fraser, R. P . . . . . '86	5 00		
French, George W. . . '87	5 00		
French, William B . . '87	5 00		
Frohwein, Richard. '86-87	10 00		
Frothingham, E. G. 85-86	10 00		
Früh, C. D. S . . . '86-87	10 00		
Frye, Geo. C. . . . . . '87	5 00		
Galt, Edw. P. . . . . '87	5 00		
Gardner, R W. . . '86-87	10 00		
Gates, H. E. . . . . . '86	5 00		
Gans, C. H . . . . . . '87	5 00		
Gaus, L. H. . . . . '87	5 00		
Gaylord, H. C . . . '86-87	10 00		
Gegelein, F. L . '85-86-87	15 00		
Geier, Oscar W . . '86-87	10 00		
Gellatly, W. A., Est. of.'84	5 00		
Gerhard, Samuel . . '85-86	10 00		
Gessner, E. A. . . . . '87	5 00		
Gibson, Charles . . . . '87	5 00		
Gill, Geo . . . . '87	5 00		
Gilmore, John W. '80-81-82-83-84-85-86	35 00		
Glines, Geo. W . . '86-87	10 00		
Godding, J. G . . . . '87	5 00		
Goebel, E. . . . . . . '86	5 00		
Good, J. M . . . . . . '87	5 00		
Goodale, H. G . . . . '85	5 00		
Goodale, Thomas T . . '86	5 00		
Goodrich, Stephen. . . '86	5 00		
Goodman, C F . . . . '87	5 00		
Goodwin, L. H . . . '86	5 00		
Goodman, Emanuel . . '86	5 00		
Gosman, Adam J.'85-86-87	15 00		
Graham, W. H. . . . '87	5 00		
Grandjean, Charles . . '87	5 00		
Grandjean, Eugene . . '87	5 00		
Gray, H. R . . . . '86-87	10 00		
Green, A. L . . . . . . '87	5 00		
Gregory, E . . . . . . '87	5 00		
Gregory, W. G . . . . '86	5 00	5 00	
Greve, T. L . . . . '86-87	10 00		
Grever, J . . . . . '86-87	10 00		
Griffith, H E . . . '85-86	10 00		
Griffith, W. H. . . '84-85	10 00		
Amount carried forward	$1870 00	$55 00	$22 50

	Annual Dues.	Membership Fees.	Certificates.
Amount brought forward	$1870 00	$55 00	$22 50
Grossklaus, J. F . . . '87	5 00		
Gundrum, George. '85-86-87	15 00		
Haass, G. H . . . . . '87	5 00		
Haber, Louis A. '84-85-86-87	20 00		
Hadley, F. R. . . . . '87	5 00		
Haenchen, C. E . . . '87	5 00		
Haight, Wm. B . . . . '87	5 00		
Hall, E. B . . . . . . '87	5 00		
Hall, M. C . . . . . . '87	5 00		
Hance, E. H . . . . '87	5 00		
Hancock, C. W .'85-86-87	15 00		
Hanson, Dominicus '84-85-86	15 00		
Hanson, W. T . . . . '86	5 00		
Hardigg, W. L . . '86-87	10 00		
Harlow, N. H . . . '87	5 00		
Harrison, Jacob H . . '87	5 00		
Hartshorn, F. A . . '86-87	10 00		
Harwood, F. L. .'84-85-86	15 00		
Hassebrock, H. F. . . '87	5 00		
Hassinger, S. E. R . . '86	5 00		
Hattenhauer, R. C . . '87	5 00		
Hatton, E. M . . . '86-87	10 00		
Hawkins, Henry . . . '87	5 00		
Hawkins, J. T . . . '85-86	10 00		
Hawkins, M S . . . . '87	5 00		
Hays, Benjamin F . . '86	5 00	5 00	
Hays, David . . '84-85-86	15 00		
Hechler, Geo. L. '85-86-87	15 00		
Hegeman, J. N . . . . '87	5 00		
Heineman, Otto . . '86-87	10 00		
Hemm, Francis . . . . '87	5 00		
Henry, Charles (Dworniczak) . '87	5 00		
Herbst, F. W . . . . . '87	5 00		
Hermann, J. G . . . . '87	5 00		
Herzfeld, Herman . . '86	5 00		
Heydenreich, Emil . . '87	5 00		
Higgins, J. S . . . '86-87	10 00		
Hildreth, N. G . . '86-87	10 00		
Hilt, David . . . . . '87	5 00		
Hobart, C. H . . . . . '86	5 00		
Hoffmann, Fred . . . '87	5 00		
Hoffman, Otto L . . '86-87	10 00		
Hohenthal, C. F. L.'86-87	10 00		
Hohly, Charles . '85-86-87	15 00		
Hollister, A. H . . . . '86	5 00		
Holmes, H. E . . . . '87	5 00		
Hood, Charles I . . . . '87	5 00		
Hopp, L C . '84-85-86-87	20 00		
Hostetter, C. M . . . '86	5 00		
Howson, Arthur B . '86-87	10 00	5 00	
Howson, W. H . . . . '87	5 00		
Huber, J. C . . . . . '86	5 00		
Hudson, Arthur '83-84-85-86-87	25 00		
Huested, A B . . . . '87	5 00		
Hunt, L. W . . . . . . '86	5 00		
Huston, Charles . . . . '87	5 00		
Hutchins, Isaiah . . '86-87	10 00		
Ihlefeld, C. H . . . '86-87	10 00		
Ingalls, A. O . . . . . '86	5 00		
Ingalls, John . . . . . '86	5 00		
Ink, Charles E . . . '86-87	10 00		
Inman, Charles T . '86-87	10 00		
Irvin, W. A . . . . . . '87	5 00		
Jacobs, Joseph . '85-86-87	15 00		
Jefferson, J. H. H . '85-86	10 00		
Jenkins, L. L . . . . . '87	5 00		
Jennings, N. H '84-85-86-87	20 00		
Johnson, C. B . . . '86-87	10 00		
Jones, Alexander H . '86	5 00		
Jones, James T . . . '86	5 00		
Jones, Simon N . . . '86	5 00		
Amount carried forward	$2450 00	$65 00	$22 50
Amount brought forward	$2450 00	$65 00	$22 50
Jordan, W. H . . . '86-87	10 00		
Joy, E. W . . . . . . '87	5 00		
Jungmann, J . . '85-86-87	15 00		
Kadlec, L. W . . . . '86	5 00		
Kalish, J. . . . . . . '86-87	10 00		
Karb, G. J. . '84-85-86-87	20 00		
Kauffman, G. B. . . . '87	5 00		
Keasbey, H. G . . . . '86	5 00		
Keeler, W. H . . . '84-85	10 00		
Kelley, Edward S. . . '87	5 00		
Kellogg, Gardner . . . '86	5 00		
Kennedy, Geo. W . '86-87	10 00		
Kennedy, Thomas . . '86	5 00		
Kent, Henry A., Jr . . '86	5 00		
Kessler, E. F. . . . . '86	5 00		
Kienth, Hans. . . . . '87	5 00		
Kilmer, Frederic B . '86	5 00	5·00	
Kirchhofer, P. P. . '86-87	10 00		
Kitchen, C. W . . . . '87	5 00		
Klayer, Louis . . '86-87	10 00		
Klie, George H C . . '87	5 00		
Kline, Mahlon N . . '87	5 00		
Knock, T. F . . . . '87	5 00		
Knoebel, Edmund. . . '87	5 00		
Knoefel, August . . . '86	5 00		
Koch, Louis . . . . . '87	5 00		
Koehnken, H. H . . . '86	5 00		
Krehe, J. T . . . . '86-87	10 00		
Krieger, Philip . . . '87	5 00		
Kuhn, N. A . . . . '86-87	10 00		
Kurfurst, H. F . . . '86-87	10 00		
Laber, Julius . . . '86-87	10 00		
Lauer, Michael J.'85-86-87	15 00		
Lautenbach, Robert'85-86	10 00		
Lawton, C. H. . . . '87	5 00		
Lawton, Horace A . . '87	5 00		
Lazell, Lewis T. . . . '87	5 00		
Lee, James A. . . . . '87	5 00		
Lehn, Louis . . . . . '86	5 00		
Lehr, Philip. . . . '86-87	10 00		
Leis, George . . . . . '86	5 00		
Lemberger, Joseph L . '87	5 00		
Lengfeld, Abraham L . '87	5 00		
Libby, H. F . . . . . '86	5 00		
Lloyd, John U. . . '86-87	10 00		
Lockhart, George B.'85-86	10 00		
Loomis, John C. . . . '87	5 00		
Lowd, John C. . . . . '87	5 00		
Ludlow, Charles . . . '87	5 00		
Luhn, Gustavus J. . . '86	5 00		
Luscomb, William E.'86-87	10 00		
Lyons, Albert B. . . . '86	5 00		
Lyons, Isaac L . . '84	5 00		
Macdonald, D. T. . '86-87	10 00		
Mack, Adolph . . . . '87	5 00		
Macmahan, Thomas J.'86	5 00		
Main, Thomas F . . . '86	5 00		
Maisch, Henry C. C. . '87	5 00		
Major, John R . . . . '86	5 00		
Mallinckrodt, Edward. '87	5 00		
Markoe, George F. H . '87	5 00		
Marquardt, J. F. '83-84-85	15 00		
Marshall, Ernest C.'86-87	10 00		
Marsteller, George L. . '86	5 00		
Martin, J C. . . . . . '85	5 00		
Martin, Wm. J . . '86-87	10 00		
Masi, Fred. H . . . '85-86	10 00		
Mason, Alfred H . . . '87	5 00		
Masters, R S. . . . . '86	5 00		
Mattison, R. V . . . '86	5 00		
May, Arthur F . '85-86-87	15 00		
May, James O. '82-83-84-85-86	25 00		
Mayell, Alfred. '84-85-86-87	20 00		
McCarthy, Cornelius J.'86	5 00	5 00	$5 00
McClure, Archibald. . '87	5 00		
Amount carried forward.	$3010 00	$75 00	$27 50

	Annual Dues.	Membership Fees.	Certificates.
Amount brought forward	$3010 00	$75 00	$27 50
McClure, William H. . '87	5 00		
McDonald, George . . '86	5 00		
McElhenie, Thomas D.'87	5 00		
McIntyre, Ewen. . '86–87	10 00		
McIntyre, William . '86–87	10 00		
McKesson, John, Jr'86–87	10 00		
McLeod, Roderick. . . '86	5 00		
McNeil, John M . . '86–87	10 00		
Mehringer, Jos A . '84–85	10 00		
Meininger, Albert . '86–87	10 00		
Menkemeller, Charles . '87	5 00		
Merrell, George. . . . '86	5 00		
Meyer, Christian F. G.'87	5 00		
Meyers, Edward T., Estate of . . . . . . '84–85	10 00		
Michaelis, Charles O. . '86	5 00		
Michaelis, Gustavus. . '87	5 00		
Milburn, John A . . . '86	5 00		
Milburn, Washington C.'86	5 00		
Milhau, Ed. L. . '85–86–87	15 00		
Miller, Adolph W . . . '87	5 00		
Miller, Jason A . . . . '87	5 00		
Miller, Joseph G . '86–87	10 00	5 00	
Miller, Otho F. S . '86–87	10 00		
Miller, R. McC . . '85–86	10 00		
Milliner, W. T . . . . '87	5 00		
Mohr, Chas . . . . '85–86	10 00		
Moore, George. . . . '87	5 00		
Moore, J. B . . . . '85–86	10 00		
Moore, Silas H . . . '86–87	10 00		
Morley, William J . . '87	5 00		
Morrell, Mary H . . . '87	5 00		
Morris, Lemuel I . . '85–86	10 00		
Mott, George F . . '84–85	10 00		
Mueller, Adolph . . . '87	5 00		
Murray, Bernard J. '83–84–85–86	20 00		
Musler, Abram. . . '86–87	10 00		
Myers, Daniel . . '85–86	10 00		
Nagle, Asher C . . . . '85	5 00		
Nattans, Arthur . . . . '86	5 00		
Newman, George A . . '86	5 00		
Nichols, John C . . '86–87	10 00	5 00	
Nichols, Thomas B.'85–86	10 00		
Nipgen, J. A . . . . . . '87	5 00		
Noble, John J . . . '86–87	10 00		
O'Neil, H. M . . '84–85–86	15 00		
Oliver W. M . . . . . . '86	5 00		
Orne, Chas. P . . . . . '87	5 00		
Orne, Joel S . . . . . . '87	5 00		
Osgood, Hugh H . . . '87	5 00		
Osmun, Charles A . . '86	5 00		
Otis, Clark Z . . . . . '86	5 00	5 00	
Ottinger, James J . . . '86	5 00		
Owens, James A . . . '87	5 00		
Owens, Richard J . . . '87	5 00		
Paine, Milton K . . . . '87	5 00		
Painter, Emlen . . . '86–87	10 00		
Panknin, C. F . . . . '86	5 00		
Parcher, George A . . '87	5 00		
Parker, J. H . . . . . '86	5 00		
Parsons, John . . . . . '86	5 00		
Parsons, R. E . '85–86–87	15 00		
Partridge, Chas. K. '86–87	10 00		
Patch, Edgar L . . . . '87	5 00		
Patton, John F. . . . '87	5 00		
Pauley, Frank C . . . '87	5 00		
Pease, Francis M . . . '87	5 00		
Peck, George L . . . '87	5 00		
Peixotto, M. L. M . . '83	5 00		
Pennington, T. H.S.'85–86	10 00		
Perkins, Benjamin A . '87	5 00		
Perkins, William A.'86–87	10 00		
Perry, F. W . . . . . '86	5 00		
Pettengill, Edward T . '86	5 00		
Pettit, Henry M.'85-86-87	15 00		
Pfingst, Edward C . . '86	5 00		
Amount carried forward	$3560 00	$90 00	$27 50

	Annual Dues.	Membership Fees	Certificates.
Amount brought forward	$3560 00	$90 00	$27 50
Pfingst, Henry A . . . '86	5 00		
Pfingsten, Gustavus '85–86–87	15 00		
Phelps, Dwight. . . . '87	5 00		
Phillips, Charles W '84–85–86	15 00		
Physick, Henry S. . . '87	5 00		
Pierce, William H. . . '86	5 00		
Pilsbury, Frank O . . '87	5 00		
Pitt, John R , Jr. . '86–87	10 00		
Plummer, David G . . '87	5 00		
Porter, Henry C . . . '87	5 00		
Post, Elisha . . . . '86–87	10 00		
Potterfield, C. A. . '86–87	10 00		
Powell, R. B. . . . '86–87	10 00		
Power, Frederic B. '86–87	10 00		
Prescott, Albert B. . '87	5 00		
Prescott, Horace A.'86–87	10 00		
Preston, Andrew P . '87	5 00		
Preston, David. . . '86–87	10 00		
Prieson, Adolph. . . '87	5 00		
Procter, Wallace. . '86–87	10 00		
Punch, William F . '85–86	10 00		
Purcell, John B . . . . '87	5 00		
Pursell, Howard . . '86	5 00		
Quckainbush, Benjamin F '86–87	10 00	5 00	
Rademaker, H. H . . '86	5 00		
Ramsperger, Gustav . '86	5 00		
Rapelye, Charles A. . '86	5 00		
Redsecker, Jacob H. . '87	5 00		
Reed, Isaac N . . . . '87	5 00		
Reichardt, F. A . . '86–87	10 00		
Rendigs, C. P . . . '86–87	10 00		
Renouff, James T. . . '86	5 00		
Renz, Frederick J . . . '86	5 00		
Restieaux, Thomas . . '87	5 00		
Reusch, Ernst . . . . '87	5 00		
Reynolds, Howard P . '87	5 00		
Reynolds, John J. '85–86–87–88	20 00		
Reynolds, William K . '87	5 00		
Rhoades, S. H . . . . '87	5 00		
Rice, Charles . . . '86–87	10 00		
Rich, Willis S . . . . . '87	5 00		
Richardson, Frank . . '86	5 00		
Richardson, J. Clifford.'87	5 00		
Richardson, James . . '87	5 00		
Rickey, Charles F . . '87	5 00		
Rickey, Randall . . '86–87	10 00		
Ricksecker, Theodore. '85	5 00		
Riley, C. W. . . . . . '86	5 00		
Robbins, D. C . '85–86–87	15 00		
Robert, D. J . . . . '86	5 00		
Roberts, Joseph . '86 87	10 00		
Robinson, James S . . '87	5 00		
Rockefeller, Lucius. '86–87	10 00		
Rogers, Wiley . . . . '86	5 00		
Rogers, Wm. H. '83–84–85–86–87	25 00		
Rohde, Claus F . . . . '86	5 00		
Ronnefeld, Theodore . '87	5 00		
Rosengarten, M. G . '87	5 00		
Rosenwasser, Nathan . '85	5 00		
Royce, L. M '83–84–85–86	20 00		
Runyon, Edward W . '87	5 00		
Ruppert, John . . . '86–87	10 00		
Rust, William . . . . '87	5 00		
Ryerson, H. O . . . . '87	5 00		
Sander, Enno . . . '87	5 00		
Sands, George G . . '86–87	10 00		
Sauer, Louis W . . '86–87	10 00		
Sauerhering, R. A . '86–87	10 00		
Saunders, William . '85–86	10 00		
Sautter, Louis . . . . '87	5 00		
Sawyer, William F . . '87	5 00		
Sayre, William H . '85–86	10 00		
Amount carried forward	$4110 00	$95 00	$27 50

	Annual Dues.	Membership Fees.	Certificates.
Amount brought forward	$4110 00	$95 00	$27 50
Schaaf, Justus H . . . '87	5 00		
Schafer, George H '86-87	10 00		
Schaffle, Samuel W . . '86	5 00		
Schafhirt, Adolph J.'85-86	10 00		
Schambs, G. M '85-86-87	15 00		
Scheffer, Emil . . . . '86	5 00		
Scheffer, Henry W . . '87	5 00		
Schellentrager, E. A.'86-87	10 00		
Scherff, John P . . '86-87	10 00		
Scherling, Gustav . '86-87	10 00		
Schermerhorn, W. S . '87	5 00		
Schiemann, Edward B. '86	5 00		
Schlaepfer, Henry J. . '87	5 00		
Schmid, Henry . . . . '86	5 00	5 00	
Schmidt, Florian C . . '86	5 00		
Schmitt, Joseph M . . '87	5 00		
Schoettlin, Albert J. . '86	5 00		
Scholtz. Edmund L. . '86	5 00		
Schranck, Henry C.'86-87	10 00		
Schreck, Leo S. '84-85-86-87	20 00		
Schueller, Ernst. . . . '87	5 00		
Schueller, Frederick W.'87	5 00		
Scofield, J. S . . . '84-85	10 00		
Scott, George T. . . . '87	5 00		
Scott, William H . . . '87	5 00		
Scott, William J . . . '83	5 00		
Seabury, George J. '86-87	10 00		
Searby, William M. . . '87	5 00		
Sedberry. Bond E. . . '87	5 00		
Seitz, Oscar . . . . '86-87	10 00		
Senior, Frederick S . . '87	5 00		
Sennewald, Ferdinand W. '87	5 00		
Serodino, Herman . '84-85	10 00		
Sewall, David, J . . . '87	5 00		
Shaw, Robert J. . . '87	5 00		
Sheils, George E . '86-87	10 00		
Sherwood, Louis W . . '87	5 00		
Shinn, James T. . . . '86	5 00		
Shoemaker, Richard M '87	5 00		
Short, J. Eagan. . . . '85	5 00		
Shreve, John A . . . . '86	5 00		
Shriver, Henry . . . . '87	5 00		
Shryer, Thomas W . . '87	5 00		
Shurtleff, Israel H. '87	5 00		
Siegemund, Charles A. '87	5 00		
Siegenthaler, Harvey N'87	5 00		
Simms, Giles G. C . . '86	5 00		
Simon, William . '86-87	10 00		
Simson, Francis C. . . '86	5 00		
Sitton, Charles E. . . . '87	5 00		
Skelly, James J. '84-85-86-87	20 00		
Slater, Frank H . . '86-87	10 00		
Slosson, Frank W . '86-87	10 00		
Slosson, George . . '86-87	10 00		
Smink, William H. R '86	5 00		
Smith, Charles B. . '85-86	10 00		
Smith, Edward N . '86-87	10 00		
Smith, Israel P . . '85-86	10 00		
Smith J Hungerford . '86	5 00		
Smith, Linton . . '87	5 00		
Smith, Stephen D. '84-85-86-87	20 00		
Smith, Willard A . . '86	5 00		
Sniteman, Charles C. '86-87	10 00		
Snively, A. J . '85-86-87	15 00		
Snow, Charles W . . '87	5 00		
Snyder, A. L . . . '87	5 00		
Sombart, John E '86-87	10 00		
Spalding, Warren A . '87	5 00		
Spannagel, Charles C . '86	5 00		
Spenzer, Peter I. '84-85-86-87	20 00		
Sperry, Herman J . '87	5 00		
Amount carried forward	$4645 00	$100 00	$27 50

	Annual Dues.	Membership Fees	Certificates.
Amount brought forward	$4645 00	$100 00	$27 50
Spofford, Charles B '86-87	10 00		
Squibb, Edward H. . . '87	5 00		
Squibb, Edward R . . '87	5 00		
Stacey, Benj. F . . '86-87	10 00		
Stahler, William '84-85-86-87	20 00		
Stamford, William H. '85-86	10 00		
Stanley, Edgar C . '86-87	10 00		
Starr, Thomas. . . '86-87	10 00		
Steele, James G. . . . '87	5 00		
Stein, Jacob H. . . '86-87	10 00		
Stevens, Alonzo B . '86-87	10 00		
Stewart, Francis E. '85-86	10 00		
Stone, Clarence G. . . '86	5 00		
Stowell, Daniel . . . . '87	5 00		
Strachan, William E . '87	5 00		
Strassel, William . . . '86	5 00		
Stryker, Cornelius. . . '86	5 00	5 00	
Sweet, Abel S . . . '86-87	10 00		
Sweet, Caldwell . . '86-87	10 00		
Sweet, Henry, Estate of '80-81-82-83-84-85	30 00		
Sweet, William S . . '86	5 00		
Tartis, Alfred J. . . . '87	5 00		
Taylor, James H. '83-84-85-86	20 00		
Taylor, John P . . . . '87	5 00		
Test, Alfred W . . . . '84	5 00		
Thatcher. Henry D. . '87	5 00		
Thatcher, Joseph H . . '87	5 00		
Thomas, Oscar E . '84-85	10 00		
Thompson, Edward W.'87	5 00		
Thompson, William Scott '86	5 00		
Thompson, William Silver '85-86-87	15 00		
Thomsen, John J.'85-86-87	15 00		
Thomsen, John J., Jr. '85-86-87	15 00		
Thorn, Henry P. . '86-87	10 00		
Thurston, Azor . . '86-87	10 00	5 00	
Tiarks, Hermann . . . '87	5 00		
Tibbs, William H . . . '86	5 00		
Tilyard, Chas. S. '85-86-87	15 00		
Tobey, Charles W . '86-87	10 00		
Todd, Albert M . . '86-87	10 00		
Tomfohrde, J. W . . . '87	5 00		
Tooley, James . . . . '87	5 00		
Tower, Levi, Jr . . '87	5 00		
Townley, William M . '86	5 00		
Trask, Charles M . . '87	5 00		
Treat, Joseph A . . '86-87	10 00		
Trimble, Henry . . . . '86	5 00		
Truax, Charles . . . . '86	5 00		
Tscheppe, A . . '84-85-86	15 00		
Turner, George H . . . '87	5 00		
Tuska, David . . '84-85-86	15 00		
Twombley, John H . . '87	5 00		
Ude, George . . . . . '87	5 00		
Uhlich, Ferdinand G . '87	5 00		
Urban, Jacob P . . '86-87	10 00		
Van Antwerp, G . . '85-86	10 00		
Van Auken, Jerrie A '83-84-85-86	20 00		
Vandegrift, John A . . '87	5 00		
Vandervoort, R W . . '86	5 00		
Van Winkle, A. W. '85-86	10 00		
Vaughan, Parry W. '84-85-86-87	20 00		
Vilter, Herman, . . '86-87	10 00		
Vordlich, August H . . '87	5 00		
Voss, George W . . '86-87	10 00		
Wagner, Henry . . '85-86	10 00		
Walch, Robert H . . . '86	5 00		
Walker, Anselle . . . '87	5 00		
Walker, John P . . . '87	5 00		
Amount carried forward	$5240 00	$110 00	$27 50

	Annual Dues.	Membership Fees.	Certificates.
Amount brought forward	$5240 00	$110 00	$27 50
Walker, William J . . '87	5 00		
Wall, Otto A . . . . '87	5 00		
Walling, Walter A . . '86	5 00	5 00	
Walton, Harry C . '86-87	10 00		
Walton, Joseph R . . '86	5 00		
Wangler, C. D. '84-85-86	15 00		
Wanier, George S . . . '86	5 00		
Warder, Robert B . . '86	5 00		
Warn, William E . '86-87	10 00	5 00	5 00
Weaver, John A. '86-87-88	15 00		
Webber, Joseph L . . '86	5 00	5 00	
Wehrly, Thomas M. . '86	5 00		
Weichset, Franz . . '86-87	10 00		
Weidemann, Charles A '86	5 00		
Weiser, Emilius I. . . '87	5 00		
Welch, Leonard E. '86-87	10 00		
Wellcome, Henry S. '80-81-82-83-84-85-86	35 00		
Wellington, Arthur W. '86	5 00	5 00	
Wells, Jacob D. . . '86-87	10 00		
Wells, Romanta . . . '87	5 00		
Wendell, Henry E. '83-84-85-86	20 00		
Wenzell, William T. . '87	5 00		
Westmann, Frank H. . '87	5 00		
Weusthoff, Otto S . '86-87	10 00		
Whall, Joseph S . . '86-87	10 00		
Wheeler, Leonard H. . '87	5 00		
White, George H. . '86-87	10 00		
Whiting, Frederic T. . '87	5 00		
Whitman, Nelson S. '86-87	10 00		
Amount carried forward	$5495 00	$130 00	$32 50

	Annual Dues.	Membership Fees.	Certificates.
Amount brought forward	$5495 00	$130 00	$32 50
Whitney, Henry M . . '87	5 00		
Wichelus, Frederic . '86-87	10 00		
Wickham, William H. '85-86-87	15 00		
Wiley, Goodwin R . . '86	5 00	5 00	
Williams, Doane B. . . '87	5 00		
Williams, John K. . . '86	5 00		
Williams, Richard W . '87	5 00		
Williams, William H . '87	5 00		
Wilson, Benjamin O. . '87	5 00		
Wilson, Frank M . '87-88	10 00		
Wilson, William . . . '86	5 00		
Winslow, Samuel W. '85-86	10 00		
Winter, Jonas. . . . . '87	5 00		
Wohlfarth, Justin. '84-85-86-87	20 00		
Wood, Edward S. . '86-87	10 00		
Wright, Edward E. '86-87	10 00	5 00	
Wynn, William . . '86-87	10 00		
Yatman, John L . . '85-86	10 00		
Yorston, Matthew M. '86-87	10 00		
Young, Alexander T . '87	5 00		
Young, William . . '86-87	10 00		
Zeilin, John H. . . '86-87	10 00		
Zeller, William S. . '86-87	10 00		
Zellhoefer, George. '84-85-86-87	20 00		
Ziegler, Philip M. . '86-87	10 00		
Zoeller, Edward V. '86-87	10 00		
Zwick, George A . . '86-87	10 00		
Totals	$5740 00	$140 00	$32 50

ALPHABETICAL LIST OF THE NAMES OF MEMBERS FROM WHOM MONEY HAS BEEN RECEIVED FOR ANNUAL DUES OR CERTIFICATE, JULY 1, 1887, TO SEPTEMBER 15, 1887.

		Annual Dues.	Certificates.
Abernethy, Maxwell	'87	$5 00	
Adams, Hazen W	'87	5 00	
Aird, William	'87	5 00	$5 00
Albro, Willis H	'87	5 00	
Allaire, Charles B.	'84-85-86-87	20 00	
Anderson, Samuel.	'87	5 00	
Angney, John R.	'87	5 00	
Appleton, Henry K., Jr	'87	5 00	
Aspinall, Walter A.	'87	5 00	
Ault, Charles H	'87	5 00	
Averill, William H.	'87	5 00	
Baier, Charles G.	'87	5 00	
Baker, Walter T.	'87	5 00	
Barnum, Joseph P	'87	5 00	
Beckman, Oscar A.	'87	5 00	
Bedford, P. Wendover.	'84-85-86-87	20 00	
Best, John	'87	5 00	
Blaikie, William.	'87	5 00	
Blair, Andrew	'87	5 00	
Blanding, William B.	'87	5 00	
Borell, Henry A.	'87	5 00	
Bower, Henry.	'87	5 00	
Bower, Henry A.	'87	5 00	
Boyer, Harry	'87	5 00	
Brown, Albert E.	'87	5 00	
Brown, Albert P.	'86-87	10 00	
Brown, Robert J.	'86-87	10 00	
Browning, Woodville	'85	5 00	
Brunner, Norman I.	'87	5 00	
Bryant, Randolph F	'87	5 00	
Bunting, Samuel S	'87	5 00	
Burge, James O	'87	5 00	
Burkhardt, Mark A	'87	5 00	
Butler, Charles H	'87	5 00	
Calder, Albert L.	'87	5 00	
Campbell, Samuel	'87	5 00	
Candidus, Philip C.	'87	5 00	
Carraway, David S	'87	5 00	
Chalin, Louis Fisk	'87	5 00	
Chapin, Fred. H.	'87	5 00	
Close, George C.	'87	5 00	
Coffin, Samuel L	'85-86	10 00	
Colcord, Joseph W	'86-87	10 00	
Colgan, John	'87	5 00	
Collins, Richard D.	'87	5 00	
Cone, John W	'87	5 00	
Cook, Harry C	'87	5 00	
Cornell, Edward A.	'87	5 00	
Cressler, Charles H	'87	5 00	
Crona, Sixtus E. S.	'87	5 00	
Amount carried forward		$300 00	$5 00
Amount brought forward		$300 00	$5 00
Curtiss, Charles G.	'87	5 00	
Cushman, Henry C.	'87	5 00	
Danforth, Edmund C.	'87	5 00	
Day, Charles W.	'86–87	10 00	
DeForest, William P.	'87	5 00	
DeLang, Alfred.	'87	5 00	
Dewoody, William L	'87	5 00	5 00
Diehl, C. Lewis	'87	5 00	
Dinsmore, George F.	'84	5 00	
Dobbins, Edward T	'86–87	10 00	
Dougherty, Samuel E	'87	5 00	
Douglass, Henry, Jr.	'87	5 00	
Dreſs, Charles A	'86–87	10 00	
Dreher, Louis.	'85–86–87	15 00	
Driggs, Charles M.	'87	5 00	
Duble, Jesse B	'87	5 00	
Dubois, William L.	'87	5 00	
Duncan, Thurston B.	'87	5 00	
Dupont, William.	'87	5 00	
Eberhardt, Ernest Godlove.	'87	5 00	
Eger, George.	'86–87	10 00	
Eliel, Leo.	'87	5 00	
England, Robert.	'87	5 00	
Finnerty, Edward J., Jr.	'87	5 00	7 50
Fischer, Emil A.	'87	5 00	
Fischer, Phil;	'87	5 00	
Ford, Charles M.	'87	5 00	
Fox, Peter P.	'85–86	10 00	
Franklin, Philip H	'84–85–86-87	20 00	
Fraser, Robert P.	'87	5 00	
Gates, Howard E	'87	5 00	
George, Charles T.	'87	5 00	
Gerhard, Samuel	'87	5 00	
Gibson, James E	'87	5 00	
Goebel, Edward	'87	5 00	
Goodman, Emanuel	'87	5 00	
Goodrich, Stephen.	'87	5 00	
Goodwin, Eugene R	'87	5 00	
Goodwin, Lester H	'87	5 00	
Gorgas, George A	'87	5 00	
Gray, William H	'87	5 00	
Greene, William R	'87	5 00	
Gregory, Willis G	'87	5 00	
Gross, Edward Z	'87	5 00	
Hahn, Sigismund J. F	'87	5 00	7 50
Haigh, De Laguel	'87	5 00	
Hall, Charles E.	'87	5 00	
Hallberg, Carl S. N	'85-86	10 00	
Harbers, William H	'86-87	10 00	
Amount carried forward		$605 00	$25 00

	Annual Dues.	Certificates.
Amount brought forward	$605 00	$25 00
Harper, Harry W . . . . . '86-87	10 00	
Harrington, Frank . . . . . . '87	5 00	
Hawkins, Joseph T . . . . . . '87	5 00	
Hayes, Horace P . . . . . '86-87	10 00	
Haynes, David O . . . . '87	5 00	
Helman, Charles M . . . . . . '85	5 00	
Heun, Emil . . . . '86-87	10 00	
Hill, Justin L . . . . '87	5 00	
Hinsdale, Samuel J . . . . . . '87	5 00	
Hobart, Charles H . . . . '87	5 00	
Hodgkins, Israel M . . . . . . '87	5 00	5 00
Hoffman, Julius . . . . '87	5 00	
Hollister, Albert H . . . . . . '87	5 00	
Holmes, Clayton W . . . . . . '87	5 00	
Homer, John . . . . '87	5 00	
Hoyt, George M . . . . . . '86-87	10 00	
Hubbard, John H . . . . . '86-87	10 00	
Hughes, George . . . . '87	5 00	
Hunt, Leonard W . . . . '87	5 00	
Hurley, John . . . . . . '85-86-87	15 00	
Ingalls, John . . . . '87	5 00	
James, George R . . . . . . '84-85	10 00	
Jillson, Frederick W . . . . . . '87	5 00	
Johnson, John . . . . '87	5 00	
Jones, Alexander H . . . . . . '87	5 00	
Jones, Daniel S . . . . '87	5 00	
Jones, Samuel S . . . . '87	5 00	7 50
Jones, Simon N . . . . '87	5 00	
Jones, Thomas . . . . '87	5 00	
Karrman, William . . . . . '86-87	10 00	
Keasbey, Henry G . . . . '87	5 00	
Keeney, Caleb R . . . . '87	5 00	
Kennedy, James . . . . '87	5 00	
Keppler, Christian L . . . . '86-87	10 00	
Kerr, William W . . . . '87	5 00	
Kessler, Edward F . . . . . . '87	5 00	
Keys, Roger . . . . '87	5 00	
Knoefel, August 87	5 00	
Koehnken, Herman H . . . . . '87	5 00	
Kremers, Edward . . . . '87	5 00	
Krosskop, William B . . . . . '87	5 00	5 00
Lammert, C. Joseph . . . . '86-87	10 00	
Laurent, Eugene L . . . . . . '87	5 00	
Lee, Addison S . . . . '84-85	10 00	
Leis, George. . . . . '87	5 00	
Leist, Jacob L. . . . . '87	5 00	
Leith, Harvey I. . . . . '87	5 00	
Levy, Adolph . . . . '87	5 00	
Lewis, Samuel E . . . . '84	5 00	
Livingston, Barent V. B . . . . '87	5 00	
Ludlow, Charles. . . . . '88	5 00	
Lyons, Albert B. . . . . '87	5 00	
McDonald, George . . . . . . '87	5 00	
McFarland, Thaddeus D. . . . '87	5 00	5 00
Macmahan, Thomas J . . . . . '87	5 00	
Major, Oscar . . . . '87	5 00	
Martin, Hugo W. C. . . . . . '84-85	10 00	
Mattison, Richard V. . . . . . '87	5 00	
Melchers, Henry . . . . . . '86-87	10 00	
Menninger, Henry J. . . . . . '87	5 00	
Merrell, Ashbel H . . . . '87	5 00	
Merrell, George . . . . '87	5 00	
Metz, Abraham L . . . . '87	5 00	
Miller, Jacob A . . . . '87	5 00	
Miller, Robert McC . . . . . . '87	5 00	
Milligan, Decatur . . . . '87	5 00	
Miner, Maurice A . . . . '87	5 00	
Mohr, Charles . . . . '87	5 00	
Moore, James S . . . . '84-85	10 00	
Moore, Joachim B . . . . '87	5 00	
More, Arthur J . . . . '87	5 00	
Morgan, Benj. G. . . . . . . '84-85	10 00	
Myers, Daniel . . . . '87-88	10 00	
Newbold, Thomas M . . . '85-86-87	15 00	
Newman, George A . . . . . . '87	5 00	
Niblo, William H . . . . '87	5 00	
Nichols, Thomas B . . . . . . '87	5 00	
Amount carried forward	$1085 00	$47 50

	Annual Dues.	Certificates.
Amount brought forward	$1085 00	$47 50
Nicot, Louis E . . . . '86-87	10 00	
Norwood, Theodore F . . . . . '87	5 00	
Oldberg, Oscar . . . . . . '82-83-84	15 00	
Osmun, Charles A . . . . '87	5 00	
Otis, Clark Z . . . . '87	5 00	
Ottinger, James J . . . . '87	5 00	
Painter, Emlen . . . . '88	5 00	
Parker, George H . . . . '87	5 00	
Parkill, Stanley E . . . . '87	5 00	
Peixotto, Moses L. M. . . . '84-85	10 00	
Peyton, Robert D . . . . '87	5 00	5 00
Pfingst, Edward C. . . . . . . '87	5 00	
Pfingst, Henry A . . . . '87	5 00	
Phillips, Charles W . . . . . '87	5 00	
Pieck, Edward L . . . . '87	5 00	
Pierce, William H . . . . '87	5 00	
Pile, Gustavus . . . . '86-87	10 00	
Pinkham, Alonzo T . . . '83-84-85	15 00	
Porter, Chelton S . . . . '85-86-87	15 00	
Powell, Thomas W. . . . '83-84-85	15 00	
Prall, Delbert E . . . . . . '86-87	10 00	
Price, Charles H . . . . '87	5 00	
Punch, William F . . . . '87	5 00	
Pyle, Cyrus. . . . . '87	5 00	
Rademaker, Herman H . . . . '87	5 00	
Ramsperger, Gustavus . . . . '87	5 00	
Rapelye, Charles A . . . . . . '87	5 00	
Reiss, Edward C . . . . '83	5 00	
Renz, Frederick J . . . . '87	5 00	
Reynolds, Charles E. . . . . . '87	5 00	
Rice, Charles . . . . '88	5 00	
Richardson, William A . . . . '87	5 00	5 00
Ricksecker, Theodore . . . . . '87	5 00	
Riesenman, Joseph . . . . . . '86	5 00	
Riley, Charles W . . . . '87	5 00	
Robbins, Alonzo . . . . '87	5 00	
Robertson, Archibald C . . . '83-84	10 00	
Rogers, Wiley . . . . '87	5 00	
Rohde, Claus F . . . . '87	5 00	
Roscoe, Lucius . . . . '87	5 00	
Roth, Eugene N . . . . . '83-84-85	15 00	
Royce, Lucien M . . . . '87	5 00	
Sauder, Enno . . . . '88	5 00	
Sayre, Lucius E . . . . . . '86-87	10 00	
Scheffer, Emil . . . . '87	5 00	
Schiemann, Edward B . . . . . '87	5 00	
Schmidt, Ferdinand T . . . . . '87	5 00	5 00
Schmidt, Frederick M . . . . . '87	5 00	
Schoettlin, Albert J. . . . . . . '87	5 00	
Schreiber, August . . . . '84	5 00	
Schroeder, Hermann. . . . . . '86	5 00	
Scoville, Charles H. . . '84-85-86-87	20 00	
Serodino, Herman . . . . . '86-87	10 00	
Seykora, Edward J . . . . . . '87	5 00	
Sharples, Stephen P . . . . . . '87	5 00	
Shinn, James T . . . . '87	5 00	
Shivers, Charles . . . . . . '86-87	10 00	
Simonson, William . . . . . . '87	5 00	
Simson, Francis C. . . . . . . '87	5 00	
Smith, Willard . . . . '87	5 00	
Smith, Willard A . . . . '87	5 00	
Snow, Herbert W . . . . '87	5 00	
Spannagel, Charles C . . . . . '87	5 00	
Spears, Jacob V. . . . . '87	5 00	
Stahlhuth, Ernst H W . . . . . '87	5 00	
Stevens, S. Henry. . . . . . . '86	5 00	
Stevens, Luther F . . . . '87	5 00	
Stollenwerck, Alphonse L . . . '87	5 00	
Strassel, William . . . . '87	5 00	
Stryker, Cornelius W . . . . . '87	5 00	
Test, Alfred W . . . . '85-86	10 00	
Thomas, James, Jr . . . . . . '87	5 00	
Tobin, James M. . . . . '87	5 00	
Tooker, William W . . . . . . '84	5 00	
Trimble, Henry . . . . '87	5 00	
Tscheppe, Adolph. . . . . . . '87	5 00	
Turner, Isaac W . . . . '87	5 00	
Amount carried forward	$1580 00	$62 50

	Annnal Dues.	Certificates.
Amount brought forward	$1580 00	$62 50
Ubert, Julius C ’87	5 00	
Upson, Rosa ’87	5 00	
Van Antwerp, Garet ’87	5 00	
Vincent, Lorren S ’87	5 00	5 00
Wackerbarth, John ’87	5 00	
Wagner, Henry ’87	5 00	
Walch, Robert H ’87	5 00	
Walling, Walter A ’87	5 00	
Wangler, Conrad D ’87	5 00	
Ward, Benjamin ’87	5 00	
Warren, Edwin A ’87	5 00	
Watson, Sidney P ’87	5 00	
Webb, William H ’87	5 00	
Webber, Joseph T. ’87	5 00	
Weidemann, Charles A. ’87	5 00	
Weills, William M. L ’87	5 00	
Wellcome, Henry S ’87	5 00	
Amount carried forward	$1665 00	$67 50

	Annual Dues.	Certificates.
Amount brought forward	$1665 00	$67 50
Wellington, Arthur W ’87	5 00	
Wells, Ebenezer M ’86-87	10 00	
Wendell, Henry E ’87	5 00	
Weyer, John ’87	5 00	
Wharton, John C ’87	5 00	
Wharton, William H ’84	5 00	
Whelpley, Henry M ’87	5 00	
White, Philip A ’83-84-85-86	20 00	
Wienges, Conrad ’87	5 00	
Wight, Oscar M ’87	5 00	7 50
Williams, John K ’87	5 00	
Williams, Seward W ’87	5 00	
Woolridge, Napoleon ’86-87	10 00	
Wright, Archibald W ’87	5 00	
Young, John K ’87	5 00	5 00
Zuenkeler, John F ’87	5 00	7 50
Total	$1770 00	$87 50

LIST OF NEW MEMBERS.

1. *By election.* (See pages 477, 478, and 501.)

2. *Delegates by signing the Constitution and By-Laws:*

Charles H. Ault, St. Louis, Mo.
Sterling P. Bond, Little Rock, Ark.
Louis F. Chalin, New Orleans, La.
William L. Dewoody, Pine Bluff, Ark.
William Dupont, Detroit, Mich.
Eugene R. Goodwin, Batesville, Ark.
D. O. Haynes, Detroit, Mich.
Wm. W. Kerr, Batesville, Ark.
Stanley E. Parkill, Owosso, Mich.
Frederick M. Schmidt, Chicago, Ill.
E. J. Seykora, North Bend, Neb.
H. W. Snow, Detroit, Mich.
Jacob V. Spears, Kissimmee, Fla.
Ernst H. W. Stahlhuth, Cincinnati, O.
Alphonse L. Stollenwerck, Birmingham, Ala.
Rosa Upson, Marshalltown, Ia.
H. M. Whelpley, St. Louis, Mo.

3. *By invitation, and signing Constitution and By-Laws:*

Joseph P. Barnum, Louisville, Ky.
Otto E. Betz, Cincinnati, O.
Wilhelm Bodemann, Chicago, Ill.
Harry Boyer, Washington Court House, O.
Lucien N. Brunswig, New Orleans, La.
Isaac C. Chapman, Newburgh, N. Y.
Frederic A. Conger, St. Paul, Minn.
John Conrad, Chicago, Ill.
Frederick A. Crowther, Cincinnati, O.
John Devine, San Francisco, Cal.
Samuel W. Fairchild, New York, N. Y.
F. C. Godbold, New Orleans, La.
Charles K. Hall, New Orleans, La.
James C. Hening, Stillwater, Minn.
John A. Jungkind, Little Rock, Ark.
Ezra J. Kennedy, Detroit, Mich.
Henry Kephart, Berrien Springs, Mich.
John H. Pickett, Ames, Ia.
Oscar Robin, New Orleans, La.
William H. Ross, Richmond, Ind.
Mrs. Eliza Rudolf, New Orleans, La.
Robert J. Snyder, Louisville, Ky.
Willard H. Torbert, Dubuque, Ia.
William H. Watson, Nashville, Tenn.

LIST OF MEMBERS, DELEGATES AND LOCAL VISITORS REGISTERED AS HAVING BEEN IN ATTENDANCE AT THE THIRTY-FIFTH ANNUAL MEETING.

Names of delegates are indicated by an asterisk (*); local visitors, who are not members or delegates, are marked by a dagger (†).

† W. H. Adderley, Cincinnati, O.
* M. W. Alexander, St. Louis, Mo.
* E. F. Allen, Minneapolis, Minn.
J. H. Andrews, Seymour, Ind.
* Chas. H. Ault, St. Louis, Mo.
* J. E. Austin, Birmingham, Ala.
A. W. Bain, Cincinnati, O.
* G. W. Bains, Birmingham, Ala.
* T. Roberts Baker, Richmond, Va.
* Edmund Bakhouse, Cincinnati, O.
J. P. Barnum, Louisville, Ky.
* P. W. Bedford, New York City.
Otto E. Betz, Cincinnati, O.
* Sterling P. Bond, Little Rock, Ark.
Harry Boyer, Washington Courthouse, O.
* R. J. Brown, Leavenworth, Kan.
R. F. Bryant, Lincoln, Kan.
* J. O. Burge, Nashville, Tenn.
C. H. Butler, Oswego, N. Y.
* P. C. Candidus, Mobile, Ala.
* Henry Canning, Boston, Mass.
D. S. Carraway, Chattanooga, Tenn.
* L. F. Chalin, New Orleans, La.
* J. W. Colcord, Lynn, Mass.
John Colgan, Louisville, Ky.
Rich. D. Collins, Crittenden, Ky.
* Adam Conrath, Milwaukee, Wis.
* G. S. Cook, Somerville, N. J.
Harry C. Cook, Columbus, O.
F. A. Crowther, Cincinnati, O.
* H. C. Cushman, Pensacola, Fla.
* Chas. W. Day, Springfield, Ill.
* Wm. P. DeForest, Brooklyn, N. Y.
Alfred DeLang, Cincinnati, O.
* Wm. L. Dewoody, Pine Bluff, Ark.
* C. Lewis Diehl, Louisville, Ky.
J. B. Duble, Williamsport, Pa.
T. B. Duncan, Mexico, Mo.
* Wm. Dupont, Detroit, Mich.
E. G. Eberhardt, Indianapolis, Ind.
* Albert E. Ebert, Chicago, Ill.
Geo. Eger, Cincinnati, O.
* Julius H. Eichberg, Cincinnati, O.
Jos. C. Elfers, Cincinnati, O.
Leo Eliel, South Bend, Ind.
* J. H. Feemster, Cincinnati, O.
* Chas. T. P. Fennel, Cincinnati, O.
* Alex. K. Finlay, New Orleans, La.
* J. M. Good, St. Louis, Mo.
E. Goodman, Cincinnati, O.
* E. R. Goodwin, Batesville, Ark.
W. J. M. Gordon, Cincinnati, O.
* C. M. Greve, Cincinnati, O.
* T. L. A. Greve, Cincinnati, O.
Julius Greyer, Cincinnati, O.
Louis A. Haber, Cleveland, O.
DeL. Haigh, St. Louis, Mo.
* C. S. Hallberg, Chicago, Ill.
* Edgar M. Hatton, Zanesville, O.
* D. O. Haynes, Detroit, Mich.
* G. L. Hechler, Cleveland, O.
Otto Heinemann, Cincinnati, O.
† Hermann Hensel, Cincinnati, O.
N. G. Hildreth, Cheviot, O.
Jul. Hoffman, Cincinnati, O.
† A. J. Hofling. Cincinnati, O.
* L. C. Hogan, Englewood, Ill.
* A. H. Hollister, Madison, Wis.
* Clay W. Holmes, Elmira, N. Y.
* Lewis C. Hopp, Cleveland, O.
J. T. Hoskinson, Jr., Philadelphia, Pa.
Geo. Hughes, Jacksonville, Fla.
J. N. Hurty, Indianapolis, Ind.
Chas. Huston, Columbus, O.
John Ingalls, Macon, Ga.
* Chas. E. Ink, Columbiana, O.
Jos. Jacobs, Atlanta, Ga.
C. B. Johnson, Middletown, O.

Simon N. Jones, Louisville, Ky.
* J. F. Judge, Cincinnati, O.
* H. E. Kalusowski, Washington, D. C.
Geo. B. Kauffman, Columbus, O.
† J. A. Kautz, Cincinnati, O.
* Geo. W. Kennedy, Pottsville, Pa.
* Wm. W. Kerr, Batesville, Ark.
† Charles Klayer, Cincinnati, O.
Louis Klayer, Cincinnati, O.
* G. H. Chas. Klie, St. Louis, Mo.
Herman H. Koehnken, Cincinnati, O.
C. J. Lammert, Cincinnati, O.
* Jos. L. Lemberger, Lebanon, Pa.
* J. A. Lightfoot, Texarkana, Ark.
J. U. Lloyd, Cincinnati, O.
* A. B. Lyons, Detroit, Mich.
* T. J. Macmahan, New York City.
* John M. Maisch, Philadelphia, Pa.
W. J. Martin, Cincinnati, O.
* A. C. McAdams, Arkadelphia, Ark.
* Geo. McDonald, Kalamazoo, Mich.
J. M. McNeil, Scottdale, Pa.
A. Meininger, Cincinnati, O.
* H. J. Menninger, Brooklyn, N. Y.
Geo. Merrell, Cincinnati, O.
* John W. Miller, Allegheny, Pa.
Cyrus R. Morgan (stenographer), Philadelphia, Pa.
† Edw. Muhlberg, Cincinnati, O.
G. A. Newman, Louisville, Ky.
Thos. B. Nichols, Salem, Mass.
* Louis E. Nicot, Brooklyn, N. Y.
* John A. Nipgen, Chillicothe, O.
Theo. F. Norwood, Cincinnati, O.
Emlen Painter, New York.
* Stanley E. Parkill, Owossa, Mich.
John F. Patton, York, Pa.
R. D. Peyton, Louisville, Ky.
* Edward C. Pfingst, Louisville, Ky.
C. W. Phillips, Cincinnati, O.
Albert B. Prescott, Ann Arbor, Mich.
Benj. F. Quackinbush, New York City.
Joseph P. Remington, Philadelphia, Pa.
Chas. P. Rendigs, Cincinnati, O.
* A. Robbins, Philadelphia, Pa.
Wiley Rogers, Louisville, Ky.
W. H. Rogers, Middletown, N. Y.
John Ruppert, Cincinnati, O.
Enno Sander, St. Louis, Mo.
Louis W. Sauer, Cincinnati, O.
E. A. Sayre, Newark, N. J.
J. H. Schaaf, Gallipolis, O.
* Geo. H. Schafer, Fort Madison, Ia.
* Emil Scheffer, Louisville, Ky.
* Fred. M. Schmidt, Chicago, Ill.
Ernst Schueller, Columbus, O.
* Geo. J. Seabury, New York.
Herman Serodino, Cincinnati, O.
* E. J. Seykora, Omaha, Neb.
* S. A. D. Sheppard, Boston, Mass.
* Karl Simmon, St. Paul, Minn.
Wm. Simonson, Cincinnati, O.
Geo. W. Sloan, Indianapolis, Ind.
* H. W. Snow, Detroit, Mich.
A. J. Snyder, Bryan, O.
R. J. Snyder, Louisville, Ky.
* J. V. Spears, Kissimmee, Fla.
* E. H. W. Stahlhuth, Cincinnati, O.
Jacob H. Stein, Reading, Pa.
* A. B. Stevens, Ann Arbor, Mich.
* S. Henry Stevens, Pittsburgh, Pa.
* A. L. Stollenwerck, Birmingham, Ala.
C. W. Stryker, Philadelphia, Pa.
* Jos. T. Thibodeaux, Thibodaux, La.
* J. W. Thomas, Jr., Norfolk, Va.
* W. S. Thompson, Washington, D. C.
Azor Thurston, Grand Rapids, O.
Chas. W. Tobey, Troy, O.
A. M. Todd, Nottawa, Mich.
* J. W. Tomfohrde, St. Louis, Mo.
* Henry Trimble, Philadelphia, Pa.
* Rosa Upson, Marshalltown, Ia.
Geo. W. Voss, Cincinnati, O.
Henry Wagner, Cincinnati, O.
Harry C. Walton, Cincinnati, O.
S. P. Watson, Jacksonville, Fla.
* J. D. Wells, Cincinnati, O.
* Albert Wetterstroem, Cincinnati, O.
* John Weyer, Cincinnati, O.
* H. M. Whelpley, St. Louis, Mo.
* Frederic Wilcox, Waterbury, Conn.
J. Ferd. Zuenkeler, Cincinnati, O.
G. A. Zwick, Covington, Ky.

LIST OF COLLEGES AND ASSOCIATIONS

HAVING ACCREDITED DELEGATES TO THE THIRTY-FIFTH ANNUAL MEETING, WITH THE ADDRESSES OF THEIR PRESIDENTS AND SECRETARIES.

COLLEGES OF PHARMACY.

Colleges.	*Presidents.*	*Secretaries.*
Chicago	George Buck	D. H. Galloway.
Cincinnati	George Merrell	Chas. T. P. Fennel.
Cleveland	G. L. Hechler	Jos. Feil.
Louisville	E. Scheffer.	Fred. C. Miller.
Maryland (Baltimore)	Jos. Roberts	John W. Geiger.
Massachusetts (Boston)	Henry Canning.	Chas. C. Williams.
National (Washington)	F. D. Dowling	R. L. Eliot.
New York	Ewen McIntyre.	J. N. Hegeman.
Philadelphia.	Chas. Bullock	Wm. B. Thompson.
Pittsburgh	—— ———	Perry M. Gleim.
St. Louis	C. F. G. Meyer	G. H. C. Klie.

STATE PHARMACEUTICAL ASSOCIATIONS.

	Presidents.	*Secretaries.*
Alabama	J. B. Collier, Opelika	P. C. Candidus, Mobile.
Arkansas	W. W. Kerr, Batesville	J. W. Beidelman, Little Rock.
Connecticut	C. W. Whittlerey, New Haven	Frederic Wilcox, Waterbury.
Florida	H. Robinson, Ixville	J. A. Conover, Jacksonville.
Illinois	Henry Smith, Decatur	L. C. Hogan, Englewood.
Iowa	Wm. C. Bryant, Cedar Falls	Rosa Upson, Marshalltown.
Kansas	Robt. S. Drake, Beloit.	John T. Moore, Lawrence.
Kentucky	J. W. Fowler, Louisville	W. B. McRoberts, Stanford.
Louisiana	—— ———	L. F. Chalin, New Orleans.
Massachusetts	H. Canning, Boston	J. W. Colcord, Lynn.
Michigan	A. Bassett, Detroit	S. E. Parkill, Owosso.
Minnesota	J. P. Allen, Minneapolis.	E. F. Allen, Minneapolis.
Missouri	J. A. Gallagher, Kansas City	G. H. C. Klie, St. Louis.
Nebraska	M. E. Stultz, Beatrice	Chas. J. Daubach, Omaha.
New Hampshire	—— ———	C. B. Spofford, Claremont.
New Jersey	G. S. Cook, Somerville	F. B. Kilmer, New Brunswick.
New York.	Aaron Sager, Cortland	Clay W. Holmes, Elmira.
North Carolina.	F. W. Hancock, New Berne.	E. V. Zoeller, Tarboro.
Ohio	S. E. Allen, Akron	Lewis C. Hopp, Cleveland.
Pennsylvania.	Wm. L. Turner, Philadelphia	J. A. Miller, Harrisburg.

Tennessee	—— ———	J. L. Thompson, Nashville.
Virginia	R. Brydon, Danville	C. B. Fleet, Lynchburg.
West Virginia	C. S. McWhorter.	C. Menkemeller, Wheeling.
Wisconsin	R. D. Pulford, Mineral Point	E. B. Heimstreet, Janesville.
Province of Quebec.	J. A. Harte, Montreal.	Wm. Ahern, Montreal.

LOCAL ASSOCIATIONS.

	Presidents	*Secretaries.*
Berrien Co., Mich.	H. M. Dean, Niles.	
Detroit, Mich	Frank Inglis, Detroit.	
Kalamazoo, Mich.	D. O. Roberts	David McDonald.
Kings Co., N. Y	Chas. R. Paddock, Brooklyn.	F. N. Bliss, Brooklyn.
Nashville, Tenn	S. L. Demoville	E. L. Laurent.
Norfolk and Portsmouth, Va.	—— ———	J. W. Thomas, Jr., Norfolk.

ALUMNI ASSOCIATIONS OF COLLEGES OF PHARMACY.

	Presidents.	*Secretaries.*
Chicago.	D. H. Galloway	A. A. Winter.
Cincinnati.	A. W. Bain	H. Serodino.
Louisville.	Oscar C. Dilly.	E. R. Constantine.
Michigan University.	A. B. Stevens	Theo. A. Reyer.
New York.	Chas. F. Heebner	G. A. Palmer.
Philadelphia.	David W. Ross.	Wm. E. Krewson.
St. Louis	Wm. C. Bolm	H. M. Whelpley.

PUBLICATION OF THE NATIONAL FORMULARY.

REPORT OF THE COMMITTEE ON NATIONAL FORMULARY.

At a previous meeting of the Association, the Permanent Secretary was directed to issue the Proceedings to the members on or before January 1st following the meeting. To comply with this order, renders it necessary for the Secretary to have all the manuscript in his hands, in a completed state, at as early a date as possible, so as to arrange it in proper sequence, and to keep the printer supplied for a sufficient time ahead. At the last meeting it was resolved that the National Formulary should be printed in the Proceedings, aside from its being also issued in pamphlet form. In the report of the Formulary Committee submitted at that meeting, it was stated that the manuscript was in a forward state of completion, and would be ready by the time that arrangements for its being printed could be completed. But at the time when that report was written, it could not be foreseen that the Association would order the Committee to hurry the work through the press so as to enable the Permanent Secretary to insert it in the Proceedings.

Since the meeting, it has become evident that, even if the printing could have been commenced about October 1st, the Formulary could not have been completed by January 1, 1888, without great injury to the character of the text. But the printing could not even be begun until after the middle of November, because the award of the contract could not be made sooner, owing in part to the absence from home of one or more members of the Publication Committee of the Council.

In view of these circumstances, the Editing Committee, after consultation with the Permanent Secretary, decided to suggest to the Council, rather than to run the risk of disobeying both of the above-mentioned instructions of the Association, to issue the forthcoming volume of the Proceedings without the Formulary, but to insert this present report and explanation, together with a specimen of the Formulary, as now in type.

The Editing Sub-Committee will use every reasonable diligence to push the work to an early completion. As soon as it is finished, which will be about March 1, 1888, a copy of it, in pamphlet form, will be sent, agreeably to the order of the Association, to every member entitled to receive the Proceedings. And the order of the Association, that the work shall also appear in the Proceedings, can be complied with in the succeeding volume and year.

Very respectfully,
CHARLES RICE,
P. W. BEDFORD,
S. J. BENDINER,
W. P. DE FOREST,
ADOLPH TSCHEPPE,

Editing Sub-Committee of the Committee on National Formulary.

New York, December 2, 1887.

RESOLUTIONS ADOPTED BY THE COUNCIL, DECEMBER 22, 1887.

The following was offered by J. M. Maisch, and seconded by Geo. W. Kennedy:

WHEREAS, It appears from a report of the Editing Committee that the publication of the National Formulary cannot be properly accomplished before March next; therefore,

Resolved, That the Permanent Secretary be instructed, 1st, to issue the Proceedings for 1887 as soon as finished, without the Formulary; and, 2d, to send, when ready for issue, a bound copy of the Formulary to every member not in arrears with the annual dues.

Resolved, That the publication of the Formulary with the Proceedings of 1888 be referred to the Association for decision at the next annual meeting.

NOTE.—A specimen page of the Formulary has been printed on page 498.

LIST OF PUBLICATIONS RECEIVED

FOR THE AMERICAN PHARMECEUTICAL ASSOCIATION.

Societies and editors are respectfully requested to forward all publications intended for the American Pharmaceutical Association to the Permanent Secretary. European exchanges, if not sent by mail, will reach us through the Smithsonian Iestitution at Washington.

John M. Maisch,
143 North Tenth Street, Philadelphia.

☞ Proceedings of State Pharmaceutical Associations should be sent to the Reporter on the Progress of Pharmacy, C. Lewis Diehl. Louisville, Ky.

American Druggist, New York, 1887.
American Pharmacist, Detroit, 1887.
Deutsch-Amerikanische Apotheker Zeitung, New York, 1887.
Oil, Paint, and Drug Reporter, New York, 1887.
Pharmaceutical Record, 1887.
Pharmaceutische Rundschau, 1887.
The Druggists' Circular, 1887.
Report of the Trustees of the New York State Library for 1885, '86, '87.
Reports of the University of the State of New York: Regents' Reports, January 1885 and 1886; Historical and Statistical, for 1885.
American Journal of Medical Sciences, Philadelphia, 1887.
American Journal of Pharmacy, Philadelphia, 1887.
The Western Druggist, Chicago, 1887.
The National Druggist, St. Louis, 1887.
Biennial Report of the State Librarian of Iowa, 1887.
The Canadian Pharmaceutical Journal, Toronto, 1887.
Pharmaceutical Journal and Transactions, London, 1887.
Yearbook of Pharmacy and Transactions of the British Pharmaceutical Conference, 1886.
The Chemist and Druggist, London, 1887.
Calendar of the Pharmaceutical Society of Ireland, 1887.
Zeitschrift des Allgemeinen Oesterreichischen Apotheker-Vereines. Wien, 1887.
Anzeiger der K. K. Akademie der Wissenschaften. Wien, 1887.
Sitzungsberichte der K. B. Akademie der Wissenschaften, 1886, 1–3, 1887, 1.
Inhaltsverzeichniss der Sitzungsberichte, 1871–1885.
Nachrichten von der K. Gesellschaft der Wissenschaften zu Göttingen, 1886.
Bollettino delle Pubblicazioni Italiane, 1887.
Proceedings of the American Academy of Arts and Sciences, New Series XIV., 1, 2.
Transactions of the South Carolina Medical Association, 1887.
Transactions of the Medical and Chirurgical Faculty of the State of Maryland, 1887.

LIST OF SOCIETIES, LIBRARIES, JOURNALS, AND INDIVIDUALS,

TO WHOM COMPLIMENTARY COPIES OF THE PROCEEDINGS OF THIS ASSOCIATION ARE FORWARDED.

The State Libraries of all the States of the Union except Connecticut. (At the request of the State Librarian of Connecticut, a copy of the Proceedings is sent to Trinity College, Hartford, Conn.)

Alabama.—Alabama Pharmaceutical Association, P. C. Candidus, Secretary, Mobile.
Arkansas.—Arkansas Association of Pharmacists, J. W. Beidelman, Secretary, Little Rock
California.—California College of Pharmacy, San Francisco.
Colorado.—
Connecticut.—Connecticut Pharmaceutical Association, F. Wilcox, Secretary, Waterbury.
" Medical Journal and Library Association, Hartford.
" Trinity College, Hartford.
" Silas Bronson Library, Waterbury.
" Yale College, New Haven.
Dakota.—Dakota Pharmaceutical Association.
Delaware.—
District of Columbia.—National College of Pharmacy, Washington.
" Bureau of Education, Washington.
" Congressional Library, Washington.
" Department of Agriculture, Washington.
" Library of the American Medical Association, Washington.
" Smithsonian Institution, Washington.
" Surgeon General, United States Army, Washington.
" Surgeon-General, United States Marine Hospital Service, Washington.
" Surgeon-General United States Navy, Washington.
" United States Patent Office, Washington.
Florida.—Florida State Pharmaceutical Association, J. A. Conover, Secretary, Jacksonville.
Georgia.—Georgia Pharmaceutical Association, H. R. Slack, Jr., Secretary, La Grange.
Illinois.—Illinois Pharmaceutical Association, L. C. Hogan, Secretary, Englewood.
" Chicago College of Pharmacy, Chicago.
" The Western Druggist, Chicago.
Indiana.—Indiana Pharmaceutical Association, J. R. Perry, Secretary, Indianapolis.
" Purdue University, Lafayette.
Iowa.—Iowa State Pharmaceutical Association, Rosa Upson, Secretary, Marshalltown.
Kansas.—Kansas Pharmaceutical Association, J. T. Moore, Secretary, Lawrence.
" Kansas State University, Lawrence.
Kentucky.—Kentucky Pharmaceutical Association, W. B. McRoberts, Secretary, Stanford.
Louisville College of Pharmacy, Louisville.

Louisiana.—Louisiana State Pharmaceutical Association, L. F. Chalin, Secretary, New Orleans.

Maine.—Maine Insane Asylum, Augusta.
" Bowdoin College, Brunswick.

Maryland.—Maryland Pharmaceutical Association, M. L. Byers, Secretary, Hagerstown.
" Maryland College of Pharmacy, Baltimore.
" Maryland Academy of Sciences, Baltimore.
" Medical and Chirurgical Faculty of Maryland, Dr. G. L. Taneyhill, Secretary, Baltimore.
" University of Maryland, Baltimore.

Massachusetts.—Massachusetts State Pharmaceutical Association, J. W. Colcord, Secretary, Lynn.
" Amherst College, Amherst.
" American Academy of Arts and Sciences, Boston.
" Boston Athenæum, Boston.
" City Library, Boston.
" City Hospital, Boston.
" Harvard University, Cambridge.
" Massachusetts College of Pharmacy, Boston.
" Massachusetts General Hospital, Boston.
" Medical Library Association, Boston.

Michigan.—Michigan State Pharmaceutical Association, S. E. Parkill, Secretary, Owosso.
" American Pharmacist, Detroit.
" The Pharmaceutical Era, Detroit.
" University of Michigan, Ann Arbor.

Minnesota.—Minnesota State Pharmaceutical Association, E. F. Allen, Secretary, Minneapolis.

Mississippi.—Mississippi State Pharmaceutical Association, H. F. West, Secretary, Fayette.

Missouri.—Missouri State Pharmaceutical Association, G. H. C. Klie, Secretary, St. Louis.
" Academy of Science of St. Louis, St. Louis.
" National Druggist, St. Louis.
" St. Louis College of Pharmacy, St. Louis.
" St. Louis Mercantile Library, St. Louis.
" St. Louis Public School Library, St. Louis.

Nebraska.—Nebraska State Pharmaceutical Association, C. J. Daubach, Secretary, Lincoln.

Nevada.

New Hampshire.—New Hampshire Pharmaceutical Association, C. B. Spofford, Secretary, Claremont.
" Dartmouth College, Hanover.

New Jersey.—New Jersey Pharmaceutical Association, F. B. Kilmer, Secretary, New Brunswick.
" New Jersey State Lunatic Asylum, Trenton.

New York.—New York State Pharmaceutical Association, C. H. Holmes, Secretary, Elmira.
" Albany College of Pharmacy, Albany.
" American Druggist, New York.
" Astor Library, New York.
" College of Pharmacy of the City of New York, New York.

New York.—Deutsch-Amerikanische Apotheker Zeitung, New York.
" Druggists' Circular, New York.
" Literary and Scientific Society of German Apothecaries, New York.
" Mercantile Library, New York.
" New York Academy of Medicine, 12 West 31st Street, New York.
" Oil. Paint, and Drug Reporter, New York.
" Pharmaceutical Record, New York.
" Pharmaceutische Rundschau, New York.
" Long Island Historical Society, Brooklyn.

North Carolina.—North Carolina Pharmaceutical Association, E. V. Zoeller, Secretary, Tarboro.

Ohio.—Ohio State Pharmaceutical Association, L. C. Hopp, Secretary, Cleveland.
" Cincinnati Academy of Medicine, Cincinnati.
" Cincinnati College of Pharmacy, Cincinnati.
" Mussey Medical Library, Cincinnati.
" Longview Asylum, Carthage, Hamilton county.

Oregon.

Pennsylvania.—Pennsylvania Pharmaceutical Association, J. A. Miller, Secretary, Harrisburg.
" Academy of Natural Sciences, Philadelphia.
" American Journal of Medical Sciences, Philadelphia.
" American Journal of Pharmacy, Philadelphia.
" American Philosophical Society, Philadelphia.
" College of Physicians, Philadelphia.
" Franklin Institute, Philadelphia.
" Mercantile Library, Philadelphia.
" Pennsylvania Hospital, Philadelphia.
" Philadelphia College of Pharmacy, Philadelphia.
" Philadelphia Library, Philadelphia.
" Pittsburgh College of Pharmacy, Pittsburgh.

Rhode Island.—Rhode Island Pharmaceutical Association, A. W. Wellington, Secretary, Providence.
" Brown University, Providence.

South Carolina.—South Carolina Pharmaceutical Association, ——— Secretary.
', South Carolina Medical Association, Dr. J. L. Dawson, Secretary, Charleston.

Tennessee.—Tennessee Druggists' Associations, J. L. Thompson, Secretary, Nashville.

Texas.—Texas State Pharmaceutical Association, E. D. Oesch, Secretary, Fort Worth.

Vermont.—University of Vermont, Burlington.

Virginia.—Virginia Pharmaceutical Association, C. B. Fleet, Secretary, Lynchburg.

West Virginia.—West Virginia Pharmaceutical Association, C. Menkemeller, Secretary, Wheeling.

Wisconsin.—Wisconsin Pharmaceutical Association, E. B. Heimstreet, Secretary, Janesville.
" University of Wisconsin, Madison.

Canada.—Halifax Pharmaceutical Society, Halifax, Nova Scotia.
" Ontario College of Pharmacy, Toronto.
" Pharmaceutical Association of the Province of Quebec, Wm. Ahern, Secretary, Montreal.

Mexico.—Escuela de Farmacia, Mexico.

Argentine Republic.—Sociedad de Farmacia Argentina.

Austria.—Zeitschrift d. Allg. Oesterreichischen Apotheker-Vereines, Wien.
" K. K. Gesellschaft der Aerzte, Wien.
" K. Akademie der Wissenschaften, Wien.
Belgium.—Académie Royale de Médecine de Belgique, Bruxelles.
" Société de Pharmacie Royale de Bruxelles.
" Société Royale des Sciences Médicales et Naturelles, Bruxelles.
" Société de Pharmacie d'Anvers.
Denmark.—Archiv for Pharmacie, S. M. Trier, Kjobenhavn.
" Denmark's Apotheker Forening, Gust. Lodze, President, Odense.
France.—Bibliothèque de l' École supérieure de Pharmacie, Paris.
Germany.—Archiv der Pharmacie, Waisenhausbuchhandlung, Halle.
" K. Akademie der Wissenschaften, Göttingen.
" K. Bayer. Akademie der Wissenschaften, München.
" K. Bibliothek der Universität Strassburg.
" Pharmaceutisches Institut, Universität Erlangen.
Great Britain.—British Pharmaceutical Conference, London, 17 Bloomsbury Square.
" Pharmaceutical Society of Great Britain, London, 17 Bloomsbury Square.
" Pharmaceutical Journal and Transactions, London, 17 Bloomsbury Square.
" Chemical News, London, Boy Court, Ludgate Hill, E. C.
" Chemist and Druggist, London, 44 Cannon Street.
" British Museum, London.
" Association of Chemists and Druggists, Wolverhampton.
" Coventry and Warwickshire Pharmaceutical Association, Coventry.
" Liverpool Chemists' Association.
" Pharmaceutical Society at Edinburgh, 36 York Place.
" Pharmaceutical Society of Ireland, Dublin.
" Philosophical Society, Glasgow.
Italy.—R. Biblioteca Nazionale, Firenze.
" Archivio di Farmazia, Roma.
Netherlands.—Nederlandsche Maatschappij ter bevordering der Pharmacie, Jacobus Polak, Secretary, Amsterdam.
Norway.—Kongelige Norske Universitet i Christiani.
Russia.—Pharmaceutische Gesellschaft in St. Petersburg, St. Petersburg.
" Pharmaceutisches Institut, Dorpat, Russia.
Sweden.—Pharmaceutical Institution, Stockholm, Sweden.
Switzerland.—Schweizerische Wochenschrift für Pharmacie, A. Klunge, Aubonne.
Australia.—Pharmaceutical Society of Victoria, Melbourne.
" Pharmaceutical Society of New South Wales, Sydney.
" Pharmaceutical Society of New Zealand, Auckland.

CONSTITUTION AND BY-LAWS

OF THE

AMERICAN PHARMACEUTICAL ASSOCIATION.

CONSTITUTION.

ARTICLE I. This Association shall be called the "American Pharmaceutical Association." Its aim shall be to unite the educated and reputable Pharmacists and Druggists of America in the following objects:

1. To improve and regulate the drug market, by preventing the importation of inferior, adulterated, or deteriorated drugs, and by detecting and exposing home adulteration.

2. To encourage proper relations between Druggists, Pharmaceutists, Physicians, and the people at large, which shall promote the public welfare, and tend to mutual strength and advantage.

3, To improve the science and art of Pharmacy by diffusing scientific knowledge among Apothecaries and Druggists, fostering pharmaceutical literature, developing talent, stimulating discovery and invention, and encouraging home production and manufacture in the several departments of the drug business.

4. To regulate the system of apprenticeship and employment, so as to prevent, as far as practicable, the evils flowing from deficient training in the responsible duties of preparing, dispensing and selling medicines.

5. To suppress empiricism, and to restrict the dispensing and sale of medicines to regularly educated Druggists and Apothecaries.

6. To uphold standards of authority in the Education, Theory and Practice of Pharmacy.

7. To create and maintain a standard of professional honesty equal to the amount of our professional knowledge, with a view to the highest good and greatest protection to the public.

ARTICLE II. This Association shall consist of active, life, and honorary members, and shall hold its meetings annually.

ARTICLE III. The officers of the Association shall be a President, three Vice-Presidents, a Permanent Secretary, a Local Secretary, a Treasurer, and a Reporter on the Progress of Pharmacy, all of whom, with the exception of the Permanent Secretary, shall be elected annually, and shall hold office until an election of successors.

ARTICLE IV. All moneys received from life membership, together with such funds as may be bequeathed, or otherwise donated to the Association, shall be invested by the Treasurer in United States Government or State securities, the annual interest of which only shall be used by the Association for its current expenses.

ARTICLE V. Every proposition to alter or amend this Constitution shall be submitted in writing, and may be balloted for at the next Annual Meeting, when upon receiving the votes of three-fourths of the members present, it shall become a part of this Constitution.

BY-LAWS.

CHAPTER I.

Of the President and Vice-Presidents.

ARTICLE I. The President shall preside at all meetings of the Association, except those of the special Sections, as hereinafter provided. In his absence or inability, one of the Vice-Presidents, or in the absence of all, a President *pro tempore*, shall perform the duties of President.

ARTICLE II. In the absence of the Permanent Secretary, the President shall appoint a Recording Secretary *pro tempore.*

ARTICLE III. In meetings the President shall take the chair at the proper time; announce all business; receive all proper motions, resolutions, reports, and communications, and order the vote upon all proper questions at the proper time.

ARTICLE IV. In all ballotings, and on questions upon which the ayes and nays are taken, the President is required to vote, but his name shall be called last; in other cases he shall not vote, unless the members be equally divided, or unless his vote, if given to the minority, will make the decision equal, and in case of such equal division, the motion is lost.

ARTICLE V. He shall enforce order and decorum; it is his duty to hear all that is spoken in debate, and in case of personality or impropriety, he shall promptly call the speaker to order. He shall decide all questions of order, subject to the right of appeal, unless in cases where he prefers to submit the matter to the meeting; decide promptly who is to speak when two or more members rise at the same moment, and be careful to see that business is brought forward in proper order.

ARTICLE VI. He shall have the right to call a member to the chair, in order that he may take the floor in debate. He shall see that the Constitution and By-Laws are properly enforced.

ARTICLE VII. He shall appoint all committees, unless provided for in the By-Laws, or otherwise directed by the Association.

ARTICLE VIII. He shall sign the certificates of membership, and countersign all orders on the Treasury. He shall obey the instructions of the Association, and authenticate by his signature, when necessary, its proceedings.

ARTICLE IX. He shall present at each annual meeting an address, embodying general scientific facts and events of the year, or discuss such scientific questions as may to him seem suitable to the occasion.

CHAPTER II.

Of the Permanent Secretary.

ARTICLE I. The Permanent Secretary shall be elected to hold office permanently during the pleasure of the Association. He shall receive from the Treasurer an annual salary of $750, and the amount of his expenses incident to the meeting in addition to his salary.

ARTICLE II. He shall keep fair and correct minutes of the proceedings of the meetings, and carefully preserve, on file, all reports, essays, and papers of every description received by the Association, and shall be charged with the necessary foreign and scientific correspondence, and with editing, publishing, and distributing the Proceedings of the Association, under the direction of the Council.

ARTICLE III. He shall read all papers handed him by the President for that purpose; shall call and record the ayes and nays, whenever they are required to be called; shall notify the chairman of every special committee of his appointment, giving him a list of his colleagues, and stating the business upon which the committee is to act; and shall notify every member of the time and place of each annual meeting.

CHAPTER III.

Of the Local Secretary.

ARTICLE I. The Local Secretary shall be elected annually, near the close of the annual meeting, and shall reside at or near the place where the next annual meeting of the Association is to be held.

ARTICLE II. He shall assist the Permanent Secretary in his duties; shall co-operate with the Council and any Local Committee in making arrangements for the annual meeting; shall correspond with the chairmen of the several committees, and with other members, in advance of the meeting, for the promotion of its objects, and shall have the custody of specimens, papers, and apparatus destined for use or exhibition at the meetings.

ARTICLE III. An exhibition of objects interesting to pharmacists shall be held each year, under the direction of the Local Secretary and the Committee on Commercial Interests.

CHAPTER IV.

Of the Treasurer.

ARTICLE I. The Treasurer shall collect and take charge of the funds of the Association, and shall hold, sign, and issue the certificates of membership.

ARTICLE II. He shall pay no money except on the order of the Secretary, countersigned by the President, and accompanied by the proper vouchers.

ARTICLE III. He shall report to the Council, previous to each annual meeting, the names of such members as have failed to pay their annual contributions for three years.

ARTICLE IV. He shall present a statement of his accounts at each annual meeting of the Council, that they may be audited; he shall receive an annual salary of $600, and the amount of his expenses incident to the meeting, in addition to his salary.

ARTICLE V. The Treasurer, in order that he may qualify for the office to which he has been elected, shall file a good and sufficient bond or bonds to the amount of $10,000 with the Chairman of the Council for the faithful performance of his duties as Treasurer, this bond or bonds to be signed and executed by two sureties or Trust Company acceptable to the Council.

CHAPTER V.

Of the Reporter on the Progress of Pharmacy.

ARTICLE I. The Reporter on the Progress of Pharmacy shall be elected annually, and shall receive from the Treasurer for his services an annual sum of $750.

ARTICLE II. All journals and volumes received in exchange for the Proceedings by the Permanent Secretary, and such other journals as shall be deemed necessary, shall be sent to him by that officer for use in the compilation of his report; for all of which he shall be held responsible until returned to the Permanent Secretary for preservation.

ARTICLE III. From these and other available sources, he shall prepare a comprehensive report on the improvements and discoveries in Pharmacy, Chemistry, and Materia Medica, and the collateral branches of knowledge; on the changes in conditions of Pharmaceutical Institutions; together with such statistical, biographical, and obituary notices as will furnish an epitome of the progress and changes in the science and practice of Pharmacy, and of its votaries, at home and abroad.

ARTICLE IV. The Report on the Progress of Pharmacy shall commence with July 1st of the preceding year, and end with June 30th of the year in which it is submitted; shall be written in a form fitted for the printer, and shall be presented completed at the annual meeting.

ARTICLE V. In case of the illness or other inability of the Reporter to carry on the work of the report, the Permanent Secretary and the Chairman of the Council shall be required to make the best arrangements they can command to continue the work to its completion.

CHAPTER VI.

Of the Council.

ARTICLE I. The business of the Association which is not of a scientific character shall be in charge of a Council, which shall be empowered to transact business for the Association between the times of meeting, and to perform such duties as may from time to time be committed to them by the Association; their acts, however, being subject to revision by the Association. Any member of the Association may attend the meetings of the Council, and may, by a special vote of the Council, be invited to speak on any subject under discussion.

ARTICLE II. The Council shall consist of seventeen members, nine of whom shall be elected by ballot by the Association, in the following manner: Three of them to serve for one year, three for two years, three for three years. At each subsequent annual meeting, three members shall be elected to take the places of those whose terms will then expire, to serve for the term of three years. No elected member of the Council, after having served one term, shall be eligible for re election to the Council to serve the next succeeding term.

ARTICLE III. The President, Vice-Presidents, Secretary, Local Secretary, Treasurer, and Reporter on the Progress of Pharmacy of the Association, shall be *ex officio* members of the Council.

ARTICLE IV. Vacancies which may occur in the Council shall be filled for the unexpired term or terms by the Association at its next annual meeting.

ARTICLE V. The officers of the Council shall consist of a Chairman, Vice-Chairman, and Secretary, to be elected by ballot annually by the Council.

ARTICLE VI. The Council shall be charged with the examination of the credentials of delegates, and the transaction of unfinished business of the Association, from one annual meeting to another, and with collecting, arranging, and expediting the business of the Association during the sessions of the annual meeting.

ARTICLE VII. There shall be elected annually by ballot, by the Council, three standing committees of the Council—a Committee on Membership, a Committee on Publication, and a Committee on Finance—to whom shall be referred such duties as are appropriate to their respective functions, as the Council shall direct; they shall report annually to the Council, and at such other times as the Council may direct.

ARTICLE VIII. *Section* 1. The Council shall have charge of the revision of the roll and the publication of the Proceedings.

Section 2. The Secretary of the Council shall read at each session of the Association the names of those candidates for membership which have been proposed; and the candidates shall be balloted for at the next session of the Council by the members present, when a vote of two-thirds shall be sufficient to recommend them to the Association.

Section 3. The Council shall decide upon any objections which may be presented to them (which must be in writing, with the member's name attached), referring to the fitness of the candidates for membership; and no name shall be voted on by the Association without first receiving the approval of the Council.

Section 4. The Committee on Membership shall report at each annual meeting of the Council a revised roll of members, with appropriate notices of deceased members.

ARTICLE IX. The Council shall furnish to each member of the Association not in arrears one copy of the annual publication of the Proceedings, which publication shall contain the correct roll of members, full minutes of the several sittings of the Association, a complete synopsis of the minutes of the Council, the reports of the President and Committees, together with such addresses, scientific papers, discussions, notices of new processes and preparations, as they may deem worthy of insertion, and shall fix the price at which the Proceedings shall be sold.

CHAPTER VII.

Of Committees.

ARTICLE I. There shall be six standing committees: A Committee on Commercial Interests, and on the Revision of the U. S. Pharmacopœia, each to consist of five members; a Committee on Scientific Papers, a Committee on Prize Essays, a Committee on Legislation, and a Committee on Pharmaceutical Education, each to consist of three members.

ARTICLE II. The Committee on Commercial Interests shall be appointed by the Section on Commercial Interests. They shall be charged with the work of arranging in advance the business to come before the Section at the next annual meeting. They shall propose each year a subject for discussion at the meetings of the State Associations, and at the following annual meeting of this Association, they shall present a report of the action of the State Associations upon the subject proposed.

ARTICLE III. The Committee on Scientific Papers shall be appointed by the Section on Scientific Papers. They shall arrange the business of the Section, and shall report, near the close of each annual meeting, a proper number of questions of scientific and practical interest, the answers to which may advance the interest of Pharmacy, and shall procure the acceptance of as many such questions for investigation as may be practicable.

ARTICLE IV.—Any person writing a paper for the Assocaition must, to insure its publication in the Proceedings, refer the same, with a synopsis of its contents, to the Committee on Scientific Papers previous to the first session.

ARTICLE V. It shall be the duty of every Standing Committee making a report annually to the Association, in like manner to furnish a copy of the same, together with a synopsis of its contents, to the Committee on Scientific Papers before the first annual session of the Association.

ARTICLE VI. The Committee on Prize Essays, which shall be appointed by the Chairman of the Section on Scientific Papers, shall, within six months after the annual meeting at which the essays are presented, determine which, if any of them, has met the requirements of the founder of the prize. In all other respects they shall be governed by the stipulations expressed by the donor. The decision of the Committee, with such comments upon the successful essay only as they may deem proper, may be published in the Journals of Pharmacy.

ARTICLE VII. The Committee on Legislation, which shall be elected by the Section on Legislation, shall keep a record of, and compile for reference, the enactments of the different States regulating the practice of pharmacy and the sale of medicines. They shall report to each stated meeting of the Association what legislation on the subject has occurred during the year. They shall arrange the business of the Section in advance of its meetings, and propose suitable subjects for discussion.

ARTICLE VIII. The Committee on Revision of the United States Pharmacopœia shall be appointed by the President of the Association. It shall be their duty to collect and codify such facts as may serve as a basis of the report to be presented by this Association to the National Convention for revising the Pharmacopœia. It shall collect statistics regarding the frequency with which officinal and non-officinal remedies are used in legitimate practice, and shall endeavor to ascertain the general wishes and feelings of the profession throughout the country in regard to any desired changes or improvements in the Pharmacopœia.

ARTICLE IX. The Committee on Pharmaceutical Education shall be appointed by the Section on Pharmaceutical Education, and it shall be their duty to arrange the business of the Section in advance of its meetings, to propose suitable subjects for discussion, and to attend to such duties of the Section as may be delegated to them.

CHAPTER VIII.

Of Membership.

ARTICLE I. Every pharmacist and druggist of good moral and professional standing, whether in business on his own account, retired from business, or employed by another, and those teachers of Pharmacy, Chemistry, and Botany, who may be especially interested in Pharmacy and Materia Medica, who, after duly considering the objects of the Association and the obligations of the Constitution and By-Laws, are willing to subscribe to them, are eligible to membership.

ARTICLE II. Any two members of the Association may propose to the Council the name of any person eligible to membership, and if approved, the Council shall recommend the person named to the Association, and if the Association shall by vote invite said person to become a member, his membership shall be completed by his signing the Constitution and By-Laws, and paying the annual contribution for the current year.

ARTICLE III. Every member shall pay in advance to the Treasury the sum of *Five Dollars* as his yearly contribution, and is liable to lose his membership by neglecting to pay said contribution for *three successive years.*

ARTICLE IV. Any member not in arrears to the Association, who shall pay to the Treasurer the sum of $75 during the first year of his connection therewith, or after five years $70, or after ten years $60, or after fifteen years $50, or after twenty years $40, shall become a life member, and shall be exempt from all future annual contributions.

ARTICLE V. All local organizations of Pharmacists shall be entitled to *five* delegates, as their representatives in the annual meetings, who, *if present*, become members of the Association on signing the Constitution and paying the annual contribution for the current year: Provided, that the provisions of this article shall not be so construed as to reinstate any member whose name shall have been dropped from the roll for non-payment of dues; nor shall any one who has been expelled from the Association be received as a delegate. All credentials should be sent to the Permanent Secretary *at least two weeks* in advance of the annual meeting.

ARTICLE VI. Members shall be entitled, on the payment of *Five Dollars*, to receive from the Treasurer a certificate of membership signed by the President, one Vice-President, Permanent Secretary, and Treasurer.

ARTICLE VII. Persons constitutionally elected to membership become permanent members, and their membership can cease only by resignation, non-payment of dues, or by expulsion, as provided in these By-Laws.

ARTICLE VIII. Resignations of membership shall be made in writing to the Permanent Secretary or Treasurer, but no resignation shall be accepted from any one who is in arrears to the Treasury.

All resignations shall be acknowledged in writing by the officer who receives them, and shall be reported to the Council.

ARTICLE IX. Any member may be expelled for improper conduct, or the violation of the Constitution, By-Laws, or Ethics, adopted by the Association, but no person shall be expelled unless he shall receive for expulsion two-thirds of all the votes cast at some regular session.

ARTICLE X. Pharmacists, chemists, and other scientific men, who may be thought worthy the distinction, may be elected honorary members. They shall not, however, be required to contribute to the funds, nor shall they be eligible to hold office, or vote at the meetings.

CHAPTER IX.

Of Meetings and Sections.

ARTICLE I. The meetings shall be held annually: Provided, that in case of failure of this, from any cause, the duty of calling the Association together shall devolve upon the President, or one of the Vice-Presidents, with the advice and consent of the Council.

ARTICLE II. To expedite and render more efficient the work of the Association, four Sections shall be formed, as follows: 1. Scientific Papers; 2. Commercial Interests; 3. Pharmaceutical Education; 4. Legislation.

ARTICLE III. The business of the Association shall be arranged so that the labors of each Section shall be considered only at the session or sessions to which they are especially assigned.

ARTICLE IV. The first, second, and last sessions of the annual meeting shall be devoted to the general business of the Association, and sufficient time shall be assigned to the Association at the beginning of all other sessions to read its minutes and act on the report of Council on membership.

ARTICLE V. At the third and fourth sessions the business of the Section on Commercial Interests shall be considered.

ARTICLE VI. The fifth, sixth, and seventh sessions shall be devoted to the reading of scientific papers and the discussions thereof.

ARTICLE VII. The Sections on Legislation and Pharmaceutical Education shall hold their meetings at the eighth session, either at the same time or one after the other, as may be determined by the Association.

ARTICLE VIII. A Chairman and Secretary shall be elected by ballot by each Section to serve at the special meetings of said Section. And the minutes of each meeting, together with all documents and papers which belong to each Section, must be placed as soon as possible in the hands of the Permanent Secretary for publication or safe keeping.

ARTICLE IX. The Chairman of each Section shall preside at each of its meetings, and shall prepare a short address treating upon the subjects connected with his Section, to be read before the Section at the next annual meeting.

ARTICLE X. There shall be elected by each Section a Committee, of which the Chairman of the Section shall be Chairman, to whom shall be delegated the duty of arranging in advance the business to come before the Section at the next annual meeting; these committees in each case becoming Standing Committees of the Association.

ARTICLE XI. The order of business at the first session of each annual meeting shall be as follows:

Section 1. Promptly at the time named in the notice issued for the meeting, the President, or in his absence, one of the Vice-Presidents, or, in their absence, a President *pro tempore*, shall officiate.

Section 2. In the absence of the Permanent Secretary, the President shall appoint a Recording Secretary *pro tempore*, who shall perform the duties of the Permanent Secretary until his arrival.

Section 3. Nineteen members shall constitute a quorum for the transaction of business.

Section 4. The President's address may then be read, after which the Council shall report the list of properly accredited delegates.

Section 5. The Council shall read the names of the candidates for membership, as provided in Section 2, Article VIII., Chapter VI.

Section 6. Reports of Committees shall be presented, read by their titles, the synopsis or in full, and laid on the table for future consideration.

Section 7. The President shall call the roll of States represented, requesting each State in turn to appoint two members, the persons so selected to act as a Committee to nomiinate officers for the Association and members of the Council for the ensuing year; in addition to which he shall appoint five members who are not delegates, to act with the Committee.

Section 8. The minutes of the Council shall be read in full at the annual meeting of the Association, and its acts, if approved, shall be sustained by a vote of the majority of the members present; or, if disapproved by a majority of the members present, their acts shall be revised, so as to be acceptable to the Association.

Section 9. Incidental business may be called up.

ARTICLE XII. The order of business at the second session at each annual meeting shall be as follows:

Section 1. The President shall call the Association to order.

Section 2. The Secretary shall read the minutes of the preceding session, which may be amended, if necessary, and shall then be approved.

Section 3. The report of the Committee on Nominations shall be read; when the President shall appoint tellers, and the officers nominated shall be balloted for.

Section 4. The Council shall present names recommended for membership.

Section 5. Reports of Standing Committees shall be read.

Section 6. Reports of Special Committees shall be read.

ARTICLE XIII. The order of business for the meetings of the Sections shall be determined by each Section for itself.

ARTICLE XIV. No money shall be appropriated from the Treasury by any of the Sections.

ARTICLE XV. At the last session of the Association the newly-elected officers of the Association shall take their respective places.

CHAPTER X.

Of Rules of Order and Debate.

Article I. The ordinary rules of parliamentary bodies shall be enforced by the presiding officer, from whose decision, however, appeals may be taken, if required by two members, and the meeting shall thereupon decide without debate.

Article II. When a question is regularly before the meeting, and under discussion, no motion shall be received but to adjourn, to lay on the table, for the previous question, to postpone to a certain day, to commit or amend, to postpone indefinitely; which several motions have precedence in the order in which they are arranged. A motion to adjourn shall be decided without debate.

Article III. No member may speak twice on the same subject, except by permission, until every member wishing to speak has spoken.

Article IV. On the call of any two members, the yeas and nays shall be ordered, when every member shall vote, unless excused by a majority of those present, and the names and manner of voting shall be entered on the minutes.

CHAPTER XI.

Miscellaneous.

Article I. In all such points of order as are not noticed in these By-Laws, the Association shall be governed by the established usages in all assemblies governed by parliamentary rules.

Article II. Every proposition to alter or amend these By-Laws shall be submitted in writing, and may be balloted for at any subsequent session, when, upon receiving the votes of three-fourths of the members present, it shall become a part of the By-Laws.

Article III. No one or more of these By-Laws shall be suspended.

BY-LAWS OF THE COUNCIL.

CHAPTER I.

ARTICLE I. The officers of the Council shall consist of a Chairman, Vice-Chairman. and Secretary, who shall be elected by ballot by the Council, to serve one year.

ARTICLE II. They shall be elected and shall assume the duties of their respective offices immediately after the election of the new members of the Council by the Association.

CHAPTER II.

Of the Chairman and Vice Chairman.

ARTICLE I. The Chairman shall preside at all meetings of the Council; in his absence or on account of inability from any cause, the Vice-Chairman, or, in the absence of both, a Chairman *pro tempore* shall perform the duties of Chairman.

ARTICLE II. The Chairman of the Council shall confer with the chairmen of the various special and standing committees of the Association, during its sessions, in order to arrange and expedite the business of the Association.

CHAPTER III.

Of the Secretary.

ARTICLE I. The Secretary shall keep fair and correct minutes of the proceedings of the meetings, and carefully preserve all reports and papers of every description received by the Council. He shall receive an annual salary of $50.

ARTICLE II. He shall post in a conspicuous place in the meeting room the names of the applicants for membership.

ARTICLE III. He shall read all the papers handed him by the Chairman for that purpose, shall call and record the yeas and nays whenever they are required to be called; he shall notify the Chairman of every special committee of his appointment, giving him a list of his colleagues and stating the business upon which the committee is to act, and shall notify every member of the time and place of each meeting.

CHAPTER IV.

Committee on Membership.

ARTICLE I. The Committee on Membership shall consist of five members of the Council, to be elected annually by ballot. The Fermanent Secretary and the Treasurer of the

Association shall be *ex-officio* members of this committee. The committee shall elect their chairman immediately after their election by the Council.

ARTICLE II. The Committee on Membership shall be charged with the duty of keeping a correct list of the members of the Association, and shall present the list of applicants for membership, who have complied with the requirements of the By-Laws of the Association, to the Council.

ARTICLE III. They shall furnish appropriate obituary notices of deceased members for publication in the Proceedings.

ARTICLE IV. The chairman shall receive an annual salary of 8150.

CHAPTER V.

On Committee on Publication.

ARTICLE I. The Committee on Publication shall consist of five members, to be elected by ballot by the Council, who shall elect their chairman immediately after their own election by the Council.

ARTICLE II. The Committee on Publication shall have charge of the publication and distribution of the Proceedings.

CHAPTER VI.

On Committee on Finance.

ARTICLE I. The Committee on Finance shall consist of three members. They shall audit all bills of the Association, and orders on the Treasurer for the payment of bills shall not be issued without the consent of the Finance Committee.

CHAPTER VII.

Of the Centennial Fund.

ARTICLE I. A Committee on the Centennial Fund shall be formed, consisting of the President or one of the Vice-Presidents of the Association, of the Chairman of the Committee on Finance, and of the Permanent Secretary. They shall annually, at the meetings, and after due notice through the Pharmaceutical Journals, receive applications in writing from members for grants from the interest derived from the Centennial Fund, the applications to be accompanied by a statement of the investigation to be made, and of the amount of material required—it being understood that the results of the investigation, together with a full report thereon, be laid before the annual meeting of the Association.

ARTICLE II. After considering these applications, the Committee shall, at as early a date as possible, report to the Council, recommending such grants from the available funds as they may deem proper.

ARTICLE III. The Council shall decide upon these recommendations, and shall direct orders to be drawn upon the Treasurer in favor of those members to whom grants have been made.

CHAPTER VIII.

On Meetings.

ARTICLE I. The Council shall meet on the day immediately preceding that fixed for the assembling of the Association, and at such other times as they may adjourn to, or at the call of the Chairman.

ARTICLE II. On the written application of three members to the Chairman of the Council, a special meeting shall be called.

ARTICLE III. Five members of the Council shall constitute a quorum.

ARTICLE IV. The order of business at the first session of the Council shall be as follows:

1. Organization by the election of the Chairman, Vice-Chairman and Secretary.

2. Election of the Standing Commitrees of the Council, as follows:

a. Committee on Membership, consisting of five members of the Council, the Permanent Secretary and Treasurer.

b. Committee on Finance, three members.

c. Committee on Publication, five members.

d. Committee on Centennial Fund, three members.

3. Unfinished and deferred business from the meeting of the last Council, or such business as is especially referred to the Council from the Association.

4. The reading of the names of new members as provided in the By-Laws.

5. Reading of reports and appointment of committees.

6. New business.

7. Adjournment—and before the final adjournment, the minutes of the last session shall be read and approved.

CHAPTER IX.

Miscellaneous.

ARTICLE I. Three members of any of the Standing Committees shall constitute a quorum for the transaction of business.

ARTICLE II. In all questions arising before the Council or its Committees, and which can be disposed of by a positive or a negative vote, the Chairman of the Council, or the chairman of the Committee, may take the vote of their respective bodies in writing, and the same shall have the same force and effect as if the members had been personally present.

ARTICLE III. Every proposition to alter or amend these By-Laws, shall be submitted in writing, and may be balloted for at the next session of the Council, when, upon receiving the votes of three-fourths of the members present, it shall become a part of these By-Laws.

FORM OF PROPOSITIONS FOR MEMBERSHIP.

The undersigned members in good standing, being personally acquainted with the following persons eligible to membership in accordance with Chapter VIII. Article I. of the By-Laws, testify to their moral character, their skill as practical druggists and pharmacists, and their professional probity and good standing, and they recommend them for membership in the American Pharmaceutical Association.

NAMES.	ADDRESS.

FORM FOR COMPLETING MEMBERSHIP IN ACCORDANCE WITH CHAPTER VIII. ARTICLE II. OF THE BY-LAWS.

APPROVING of the objects of the American Pharmaceutical Association, and having read its Constitution and By-Laws, I hereby signify my approval of the same, and subscribe to them, and enclose the annual contribution, five dollars, for the current year.

Name in full, --

Date, --

Address, --

GENERAL RULES ON FINANCE.

ADOPTED 1883, AMENDED 1885, 1887.

First, The Treasurer shall deposit all moneys received by him, except those belonging to the various "Funds," with some reliable banking company, where said money may be drawing interest for the benefit of the Association, said banking company to be designated by the Finance Committee, and approved by the Council.

Second, Said money shall be deposited in the name of the American Pharmaceutical Association, and all checks shall be drawn by the Treasurer, and shall be countersigned by the Chairman of the Council.

Third, All bills due by the Association shall be paid by numbered checks on said banking company, the checks, when returned to the Treasurer, to be attached to the several vouchers.

Fourth. The Treasurer shall make a deposit in the bank wherever the money in his hands shall amount to fifty dollars.

Fifth, The Chairman of the Council shall be the custodian of the bonds and saving-bank books, representing the several funds belonging to the Association; and bonds and bank-books shall be in the name of the Treasurer, and the accounts of the same shall be kept by him; duplicate accounts to be kept by the Chairman of the Council, who shall make an annual report of the same to the Association.

Sixth, There shall be annually appointed, by the Council, an Examining Committee, this Committee to consist of three members residing in or near the same city or town, the chairman to be a member of the Finance Committee.

Seventh, The Treasurer shall balance his books July 1st of each year, and shall make out, previous to the fifteenth day of July following, his annual report for the financial year just closed.

Eighth, The Treasurer having thus balanced his books and made out his report, shall forward all his books, accounts, vouchers, etc., with the report, to the Chairman of the Examining Committee, at such time and place in July of each year as said Chairman may direct.

The Chairman of the Council shall forward to the Chairman of the Examining Committee, at the same time and place, the bonds, savings-bank books, and accounts of the same that may be in his hands.

Ninth, Said books, accounts, vouchers, etc., shall be returned to the Treasurer, and said bonds, savings-bank books and accounts of the same to the chairman of the Council, all within two weeks of the date of their reception by the Chairman of the Examining Committee.

Tenth, There shall be a meeting of the Examining Committee in July of each year, and it shall be the duty of said Committee, at such meeting, to carefully examine all the books, accounts, vouchers, funds, etc., etc., received by them; and, previous to the 1st day of August following, to make a report thereon, in writing, to the Chairman of the Council.

Eleventh, The expense of the bond of the Treasurer given by a Trust Company shall be paid for from the Treasury.

ROLL OF MEMBERS.

HONORARY MEMBERS.

FOREIGN COUNTRIES.

AUSTRIA.

Anton von Waldheim, *Vienna,* 1871.

BELGIUM.

A. T. DeMeyer, *Brussels*, 1868.

Norbert Gille, *Brussels*, 1868.

ENGLAND.

Dr. John Attfield, *London*, 1871.
Dr. Robert Bentley, *London*, 1872.
Henry B. Brady, *Newcastle-on-Tyne*, 1871.
Michael Carteighe, *London*, 1882.
Thomas Greenish, *London*, 1882.
Joseph Ince, *London*, 1882.
Dr. J. Redwood, *London*, 1871.
Richard Reynolds, *Leeds*, 1882.
George W. Sandford, *London*, 1882.
Geo. F. Schacht, *Clifton, Bristol,* 1882.

FRANCE.

Dr. G. Planchon, *Paris*, 1877.

Dr. J. Léon Soubeiran, *Montpelier*, 1871.

GERMANY.

Dr. Christian Brunnengraeber, *Rostock*, 1882.
Dr. Adolph Duflos, *Annaberg*, 1871.
Dr. F. A. Flückiger, *Strassburg*, 1868.
Dr. Hermann Hager, *Pulvermühle bei Fürstenberg*, 1868.
Dr. Carl Schacht, *Berlin*, 1882.

NETHERLANDS.

Dr. J. E. De Vrij, *Hague*, 1871.

RUSSIA.

Dr. G. Dragendorff, *Dorpat*, 1868.

J. von Martenson, *St. Petersburg*, 1882.

SWITZERLAND.

Dr. Edward Schaer, *Zurich*, 1877.

ACTIVE MEMBERS.

Members are requested to report any inaccuracies in these lists, and to notify the Secretary and Treasurer of all changes of address.

(The names of life members in SMALL CAPITALS. Names of life members under the old Constitution in *italics.*)

UNITED STATES OF AMERICA.

ALABAMA.

Birmingham.

Stollenwerck, Alphonse Leander	1887

Mobile.

Brown, Albert Edward	1887
Candidus, Philip Charles.	1857
Hawkins, Joseph Thomas	1878
Mohr, Charles	1871
Punch, William Francis	1874
Van Antwerp, Garet	1880
Ward, Benjamin	1887

Selma.

Galt, Edward Pegram	1883

ARKANSAS.

Batesville.

Goodwin, Eugene Richard	1887
Kerr, William Whitman	1887

Hot Springs.

Cabell, George William	1880
Menard, Robert Patterson	1883
Newman, Alcuin Eason	1880

Little Rock.

Bond, John Barnitz	1883
Bond, Sterling Price.	1887
Gibson, James Edwin	1887
Jungkind, John August	1887

Pine Bluff.

Dewoody, William Lawrence.	1887

CALIFORNIA.

San Francisco.

Beckett, Frederick Arthur	1885
Brackett, Aurick Smith	1868
Calvert, John.	1870
Dawson, John Henry	1882
Devine, John.	1887
Joy, Edwin Wolcott	1882
Lengfeld, Abraham Louis	1879
Mack, Adolph	1880
Moffitt, Thomas Sabatier.	1861
Runyan, Edward Wheelock	1875
Searby, William Martin	1882
Simpson, William.	1870
Steele, Henry.	1859
Steele, James Gurden	1859
Wenzell, William Theodore	1870

Alameda, Alameda Co.

Elbe, Constantine Berthold	1877

Eureka, Humboldt Bay.

Powell, Robert Baldwin	1880

Red Bluff.

Darrough, Charles Henry	1884

Vallejo, Solano Co.

Frost, James	1870
Topley, James	1869

COLORADO.

Central City.

Best, John	1866

Denver.

Ford, Charles Mangan	1887
Frazee, George Blair	1880
Hartung, Hugo Rudolph	1876
Scholtz, Edmund Louis	1881
Steinhauer, Frederick	1881
Walbrach, Arthur.	1881

Salida.

Thurber, Allen Russell	1880

COLUMBIA, DISTRICT OF.

Washington.

Boyd, George Washington 1883
Bury, Edward Berkley. 1870
Christiani, Charles. 1874
Coumbe, Oscar Henry 1883
Cromwell, Zachariah William. . . . 1870
Duckett, Walter G 1876
Fickling, Charles Hollingshead . . . 1883
Johnston, Henry Augustus 1883
Knabe, Gustavus Alexander 1876
Lockhart, George Bradfield. 1883
Major, John Richards 1873
Martin, John Charles 1883
Milburn, John Alexander. 1858
Milburn, Washington Coad. 1883
Murray, Talbot Chambers 1883
Nattans, Arthur. 1883
Pettingill, Edward True 1880
Schafhirt, Adolph Julian 1876
Simms, Giles Green Craycroft. . . . 1860
Thompson, William Scott 1871
Walton, Joseph Richardson. 1883
Wehrly, Thomas McAleer 1883

CONNECTICUT.

Ansonia.

Bristol, Charles Edward 1880

Hartford.

Chapin, Frederick Hastings 1880
Goodrich, Stephen 1875
Goodwin, Lester Henry 1875
Rapelye, Charles Andrew 1876
Williams, John Kirby 1875

Litchfield.

Gates, Howard Eugene 1873

Meriden.

Parker, John Herbert 1880

Middletown.

Pitt, John Richard, Jr 1872

Naugatuck.

May, James Oscar 1875

New Britain.

Thompson, Edward Willett 1880

New Haven.

Benedict, Willis 1882
Francis, Walter Russell 1882
Gessner, Emil Adolph 1878
Spalding, Warren Alphonso 1876
Sperry, Herman Jay 1880
Wells, Romanta 1877

New London.

Nichols, John Cutter 1886

Norwich.

Osgood, Hugh Henry 1875
Sevin, Nathan Douglas 1875

Putnam.

Dresser, George Edward 1886

Stamford.

Haight, William Bogardus 1872

Thompsonville, Hartford Co.

Smith, Edward Newton 1885

Waterbury.

Dikeman, Nathan 1859
Munson, Luzerne Ithiel 1872
Wilcox, Frederick 1878
Woodruff, Roderick Samuel 1876

West Winsted.

Phelps, Dwight 1873

Willimantic.

Wilson, Frank Milton 1883

Winsted.

Renouff, James Theron 1877

DAKOTA.

Mitchell.

Warne, Henry Lee 1881

DELAWARE.

Wilmington.

Belt, Zedekiah James 1876
Smith, Linton 1870
Stewart, Francis Edward 1884

FLORIDA.

Apopka, Orange Co.

Kent, Robert Restieaux 1855

Cedar Key.

Wooldridge, Napoleon 1883

Deland.

Sutton, Peter Priest	1871

Fort George.

Rollins, John Francis	1859

Jacksonville.

Aird, William	1887
Hughes, George	1887
Watson, Sidney Powell	1887

Kissimmee.

Spears, Jacob Vurnon	1887

Pensacola.

Cushman, Henry Clay	1887

Waldo.

Wheeler, Lucien Fitch	1858

GEORGIA.

Albany.

Welch, Leonard Edward	1878

Atlanta.

Behre, Charles Henry Ernst	1882
Bradfield, Louis Henry	1878
Jacobs, Joseph	1882
Rankin, Jesse Willis	1877
Schumann, Theodore	1860

Augusta.

Durban, Sebastian Charles	1883
Land, Robert Henry	1859

Macon.

Brunner, Norman Isaac	1878
Hunt, Leonard Washington	1878
Ingalls, John	1876
McConville, Thomas Aloysius	1864

Rome.

Fenner, William Roane	1871

IDAHO TERRITORY.

Murray, Shoshone Co.

Ingalls, Albert Orfila	1885

ILLINOIS.

Bradford, Stark Co.

Plummer, David Gorham	1869
Plummer, William Pitt	1881

Camp Point, Adams Co.

Bartells, George Case	1881

Champaign.

Cunningham, Albert Palmer	1884

Chicago.

Ade, Samuel Gottlob	1883
Bartlett, Nicholas Gray	1864
BIROTH, HENRY	1865
Blahnik, Lorenz	1881
Blocki, William Frederick	1863
Bodemann, Wilhelm	1887
Buck, George	1860
Button, Charles Edwin	1881
Conrad, John	1887
Dale, William Macmillan	1880
EBERT, ALBERT ETHELBERT	1864
Fuller, Oliver Franklin	1869
Gale, Edwin Oscar	1857
Gale, William Henry	1857
Garrison, Herod Daily	1869
Grassly, Charles William	1884
Guy, George Omar	1884
Hallberg, Carl Swante Nicanor	1879
Hartwig, Charles Ferdinand	1881
Henes, William Frederick	1876
Hogey, Julius Henry	1880
Jacobus, Judson Schradlow	1870
Johnson, Stuart William	1881
Kadlec, Lawrence Wesley	1880
Lord, Thomas	1882
Martin, Hugo W. C	1881
Maynard, Henry Sherman	1880
McPherson, George	1865
Oldberg, Oscar	1873
Parsons, John	1865
Patterson, Theodore Henry	1869
Reinhold, William	1866
Sargent, Ezekiel Herbert	1864
Scherer Andrew	1884
Schmidt, Frederick Michael	1887
Sommers, Frank Giddings	1877
Thackeray, William Thomas	1884
Truax, Charles	1882
WHITFIELD, THOMAS	1865
Wilson, Julius Henry	1869
Woltersdorf, Louis	1865
Zahn, Emil Augustus	1881

Danville.

Winslow, Edwin Cook	1879

Galesburg.

Clark, Albert Burr, Jr	1868

Highland.

Knoebel, Edmund 1882
Mueller, Adolphus 1871

Mount Sterling.

Rickey, Charles Francis 1885

Peoria.

Zimmermann, Charles 1881

Peru, La Salle Co.

Hattenhauer, Robert Christopher . . 1881

Quincy.

Schroeder, Hermann 1871

Springfield.

Day, Charles Wesley 1873

INDIANA.

Anderson.

Buck, Albert Byron 1879

Aurora.

Riddell, James A 1879

Bremen.

Miller, Otho Fenn Smith 1885

Cambridge City.

McCaffrey, James 1883

Evansville.

Schmidt, Florian Charles 1882
Schlaepfer, Henry John 1879

Fairmount.

Edwards, Nathan Wilson 1879

Indianapolis.

Browning, Woodville 1882
Dill, J. Byron 1878
Driggs, Nathaniel S. 1881
Eberhardt, Ernest Godlove 1887
Frauer, Herman Emanuel 1881
Haag, Julius Alexander 1879
Hurty, John Newell 1882
Lambert, John Albert 1879
Leist, Jacob Lawrence 1881
Lilly, Eli 1878
Lynn, Winfield Scott 1882
Martin, Emil 1878
Miller, Charles Edward 1880
Mueller, Louis Henry 1879
Schrader, Henry 1869
Sloan, George White 1857
Staley, Michael Conrad 1881

Jasper, Dubois Co.

Mehringer, Joseph Andrew 1882

Jeffersonville.

Loomis, John Clarence 1876

Kendallville.

Lohman, George Henry 1872

Lafayette.

Green, Arthur Lawrence 1884
Hilt, David 1879
Yeakel, Nathan Webb 1879

La Porte.

Weichsel, Franz 1881

Madison.

Harper, Frank Merritt 1874

Michigan City.

Shrader, John L 1880

New Albany.

Knoefel, August 1879

Rensselaer.

Kanal, Emmet 1882

Richmond, Wayne Co.

Ross, William Henry 1887

Seymour.

Andrews, Josiah Harding 1879

South Bend.

Eliel, Leo 1882

Terre Haute.

Baur, Jacob 1879
Buntin, William Campbell 1874

Vincennes.

Watjen, Herman J 1882

IOWA.

Ames, Story Co.

Pickett, John Harvey 1887

Cedar Falls, Black Hawk Co.

Bryant, William Cullen 1881

Clinton.

Majer, Oscar 1880

Davenport

Ballard, John Winthrop 1871
Harrison, Jacob Hugh 1883

Decorah.

Weiser, Emilius Ilgenfritz 1880

Des Moines.

Weaver, Charles Augustus 1880

Dubuque.

Ruete, Theodore William 1870
Torbert, Willard Horatio 1887

Fort Madison.

Schafer, George Henry 1871

Indianola.

Buffington, Cyrus Adams 1880

Iowa City.

Boerner, Emil Louis 1877

Marshalltown.

Upson, Rosa 1887

Monticello.

Tiarks, Hermann 1876

Muscatine.

Krehe, John Theodor 1884

Sioux City.

Moore, Silas Harwood 1880
More, Arthur James 1881
Scherling, Gustav 1884

Stuart.

Treat, Joseph Augustus 1885

Waterloo.

Wangler, Conrad David 1876

KANSAS.

Abilene.

DeHuy, Bernard Henry 1883

Belle Plaine.

Butler, George Frank 1883

Cain City.

Crona, Sixtus Ewald Seme 1885

Coffeyville.

Slosson, George 1882

Coldwater.

Sombart, John Edward 1881

Florence.

Stanford, William Asbury 1881

Lawrence.

Leis, George 1869
Sayre, Lucius Elmer 1883

Leavenworth.

Brown, Robert J 1862

Lincoln.

Bryant, Randolph Foster 1887

Peabody.

Robert, Daniel John 1881

Pittsburg, Crawford Co.

Walker, George Theodore 1881

Salina.

Seitz, Oscar 1881

Topeka.

Merrell, Ashbel Hill 1884

KENTUCKY.

Carrollton.

Geier, Oscar William 1880

Cloverport.

Martin, Charles Carroll 1881

Covington.

Pieck, Edward Ludwig 1887
Zwick, George Albert 1874

Crittenden, Grant Co.

Collins, Richard Durbin 1887

Eminence.

Porter, Chelton Scott 1882

Flemingsburg.

Reynolds, John Jefferson 1876

Frankfort.

Averill, William Henry 1874

Louisville.

Barnum, Joseph Powers 1887
Beckman, Oscar Albert 1879
Colgan, John 1867

Diehl, Conrad Lewis	1863
Fischer, Phil	1883
Goebel, Edward	1884
Jones, Simon Newton	1870
Kessler, Edward Frederick	1879
Newman, George Abner	1866
Peyton, Robert Docker	1887
Pfingst, Edward Charles	1874
PFINGST, FERDINAND JOHN	1867
Pfingst, Henry Adolph	1874
Rademaker, Hermann Henry	1879
Renz, Frederick Jacob	1883
Rogers, Wiley	1874
Scheffer, Emil	1872
Schiemann, Edward Bernard	1880
Schoettlin, Albert John	1882
Snyder, Robert Johnson	1887
Strassel, William	1870

Shelbyville.

McKenney, Jesse Fisher	1878

Uniontown.

Hardigg, William Leopold	1881

LOUISIANA.

New Orleans.

Brunswig, Lucien Napoleon	1887
Chalin, Louis Fisk	1887
Dellavallade, Jean Michel	1873
Deléry, Edgar	1878
Finlay, Alexander Kirkwood	1883
Godbold, Fabius Chapman	1887
Hall, Charles Knap	1887
Johnson, John	1887
Keppler, Christian Lewis	1882
Lavigne, Jean Baptiste	1883
Lewis, Ben	1883
Lyons, Isaac Luria	1875
Mellon, John Joseph	1883
Metz, Abraham Louis	1887
Moore, Thomas Ferguson	1878
Robin, Oscar	1887
Rudolf, Mrs. Eliza	1887

Baton Rouge.

Brooks, Francis Marion	1879

Bayou Goula.

Viallon, Paul Louis	1870

Franklin.

Frere, Alexander Gabriel	1882

Houma.

Gonaux, François	1883

New Iberia.

Lee, James Augustin	1856

Thibodeaux.

Roth, Eugene Norbert	1880
Thibodeaux, Joseph Theogine	1870

MAINE.

Augusta.

Partridge, Charles Kimball	1867

Bangor.

Harlow, Noah Sparhawk	1859
Sweet, Abel Sylvester, Jr	1883
Sweet, Caldwell	1881

Bath.

Anderson, Samuel	1876

Belfast.

Moody, Richard Henry	1876

Bethel.

Wiley, Goodwin Robert	1886

Biddeford.

Boynton, Herschel	1875

Ellsworth.

Parcher, George Asa	1875

Pittsfield.

Libby, Henry Fitzgerald	1882

Portland.

Cummings, Henry Thornton	1853
Dana, Edmund, Jr	1877
Frye, George Carlton	1879
Hay, Henry Homer	1867
Perkins, Benjamin Abbott	1878

Winterport.

Morrell, Mary Helen	1883

MARYLAND.

Baltimore.

Baxley, Jackson Brown	1856
Brack, Charles	1876
Burrough, Horace	1883

Caspari, Charles, Jr	1883
Culbreth, David Marvel Reynolds	1883
Dohme, Charles Emile	1863
Dohme, Lewis	1859
Edwards, William Fletcher	1883
Elliott, Henry Alexander	1859
Emich, Columbus Valentine	1863
Frames, James Parker	1868
Gosman, Adam John	1870
Hancock, John Francis	1863
Jennings, Nathaniel Hynson	1857
Lauer, Michael John	1865
Moore, Jacob Faris	1856
Perkins, Elisha Henry	1857
Roberts, Joseph	1856
Russell, Eugene Janus	1856
Sappington, Richard	1870
Sharp, Alpheus Phineas	1855
Simon, William	1885
Thompson, William Silver	1856
Thomsen, John Jacob	1856
Thomsen, John Jacob, Jr.	1883
Tilyard, Charles Slade	1867
Webb, John Alanson	1870
WINKLEMAN, JOHN HENRY	1864

Chestertown.

Stam, Colin Augustus	1882
Toulson, Melbourn Ashbury	1883

Cumberland.

Herman, John George	1878
Shriver, Henry	1876
Shryer, Thomas Wilson	1875

Frederick City.

Schley, Steiner	1878

Hagerstown.

Winters, Jonas	1863

MASSACHUSETTS.

Boston.

Appleton, Henry Knox, Jr	1887
Babo, Leopold	1859
Bartlet, William Williams	1875
Bassett, Charles Harrison	1867
Bolles, William Palmer	1875
Boyden, Edward Cleveland	1874
Burley, Edward Porter	1877
Burnett, Joseph	1852
CANNING, HENRY	1865
Carter, Solomon	1865
Chapin, William Amos	1880
Colton, James Byers	1865
Cramer, Max	1881
CUTLER, EDWARD WALDO	1859
Davenport, Bennett Franklin	1879
Dinsmore, George Frederick	1879
Doliber, Thomas	1859
DRURY, LINUS DANA	1871
Durkee, William Carley	1885
Godding, John Granville	1875
Goodale, Thomas Trefethen	1879
Hoyt, George Melvin	1875
Jenkins, Luther Lincoln	1867
Jones, James Taber	1875
Jordan, William Henry	1871
Kelly, Edward Samuel	1871
Lowd, John Colby	1871
Markoe, George Frederic Holmes	1863
Melvin, James Samuel	1853
Metcalf, Theodore	1857
Mowry, Albert Daniel	1884
O'Brien, James John	1875
Patch, Edgar Leonard	1872
Patten, Ichabod Bartlett	1858
Pierce, William Herbert	1879
Prescott, Horace Augustus	1875
Richardson, William Allen	1887
Sawyer, William Frederick	1885
Sewall, David Jewett	1875
Sharples, Stephen Paschell	1875
Shedd, Edwin Walter	1879
SHEPPARD, SAMUEL AIRUS DARLINGTON	1865
Siegemund, Charles Augustus	1882
Stowell, Daniel	1875
Tower, Levi, Jr	1860
Turner, Thomas Larkin	1853
Wilson, Benjamin Osgood	1859
Woodbridge, George Washington	1859

Andover.

Parker, George Hawkins	1874

Cambridge.

Hubbard, John Henry	1866
Wood, Edward Stickney	1879

Cambridgeport.

Bayley, Augustus Ramsey	1859
Orne, Joel Stone	1859
Orne, Charles Parker	1874

Charlestown.

Marshall, Ernest Clifton	1875
Stacey, Benjamin Franklin	1860

Chelesa.

Buck, John	1855
Buck, John Lynian	1883

Dover.

Colcord, Samuel Marshall	1852

East Pepperell.

Denham, Charles Sumner	1875

Fitchburg.

Choate, John.	1877
Estabrook, Henry Arthur	1886

Great Barrington.

Whiting, Frederick Theodore.	1863

Haverhill.

Emerson, Charles Betton.	1883

Holyoke.

Ball, Charles Ely	1885

Lawrence.

Whitney, Henry Martin	1859

Lee.

Pease, Francis Merrick	1880

Lowell.

Bailey, Frederick	1869
Butler, Freeman Hall	1874
Hood, Charles Ira	1871
Kidder, Samuel	1859

Lynn.

Colcord, Joseph Webster.	1882

Marlborough.

Hartshorn, Frederick Arthur	1880

Middleboro.

Drake, Charles William	1873

Natick.

Daniels, Samuel Olney	1875

New Bedford.

Blake, James Edwin.	1866
Bunker, Elihu	1885
Hadley, Frank Rufus	1872
Lawton, Charles Henry	1873
Lawton, Horace Allen.	1873
Shurtleff, Israel Hammond	1875
Taylor, John Pitman	1875
Wright, Edward Ellsworth.	1886

Newburyport.

Goodwin, William W.	1853
Homer, John	1887

Newton.

Hudson, Arthur	1882

Newton Centre.

Noble, John Joseph	1875

North Andover.

Berrian, George Washington.	1857

Peabody.

Grosvenor, Daniel Prescott	1881

Pittsfield.

Atwood, Luther Lee	1876

Quincy.

Whall, Joseph Stokes	1873

Rockland.

Easton, Luther Waite	1875
Estes, Joseph Joslyn.	1870

Rockport.

Blatchford, Eben	1857

Salem.

Luscomb, William Edmund	1881
Nichols, Thomas Boyden.	1876
Price, Charles Henry	1882

Saugus.

Hill, James Ward Harris.	1880

Shelbourne Falls.

Baker, Edwin	1875

Somerville.

Cowdin, George Henry	1875
Flanagan, Lewis Cass	1875

Stockbridge.

Clark, William Bills.	1880

Taunton.

Drown, Lowell Appleton.	1883

Walpole.

Pilsbury, Frank Otis	1881

West Acton.

Hutchins, Isaiah 1880

West Medford.

Browne, Clarence Edward 1880

Worcester.

Bush, William 1875
Scott, George Theodore 1883
Scott, Nelson Ryan 1859
Williams, Duane Burnett. 1881

MICHIGAN.

Adrian.

Ross, Ellison Halsey 1880

Ann Arbor.

Brown, Henry Jefferson 1882
Eberbach, Ottmar. 1869
Garrigues, Samuel Smith 1855
Prescott, Albert Benjamin 1871
Stevens, Alonzo Burdette 1885

Battle Creek.

Wardell, Robert C 1860

Berrien Springs.

Kephart, Henry 1887

Detroit.

Allen, Albert Willard 1885
Baier, Charles George 1887
Caldwell, James William. 1875
Dupont, William 1887
Hawkins, Henry 1880
Haynes, David Oliphant 1887
Johnston, William 1860
Kennedy, Ezra Joseph. 1887
Lyons, Albert Byron 1885
Perry, Frederick William Riley . . . 1885
Ronnefeld, Theodore 1866
Snow, Herbert Waldemar 1887
Stone, Clarence George 1884
Vernor, James 1866
Webber, Joseph Le Roy 1886

East Saginaw.

Melchers, Henry 1869
Prall, Delbert Elwyn 1876

Grand Rapids.

Tibbs, William Henry 1871

Ionia.

Gundrum, George 1882

Jackson.

Latimer, Robert Fulton 1857

Kalamazoo.

McDonald, George 1871

Manistee.

Lyman, Asahel Hubert 1884

Menominee.

Townsend, Abram R. 1880

Muskegon.

Jesson, Jacob 1872

Nottawa, St. Joseph Co.

Todd, Albert May 1885

Owosso.

Parkill, Stanley E. 1887

Red Jacket, Houghton Co.

Macdonald Daniel Turner 1884

Saginaw City.

Keeler, William Henry 1872

Schoolcraft.

James, George Riley 1869

MINNESOTA.

Anoka.

Fries, Charles Joseph Val 1885

Minneapolis.

Allen, E. Floyd. 1885
Huhn, George 1884

Preston.

Weiser, Albert 1880

St. Paul.

Conger, Frederic Albert 1887
Simmon, Karl 1880
Stierle, Adolph 1882
Sweeny, Robert Ormsby 1866
Warren, Edwin Alonzo 1887

Spring Valley.

Rohde, Claus Frederick 1885

Stillwater.

Hening, James Courtenay 1887

MISSISSIPPI.

Aberdeen, Monroe Co.

Cordon, John Gray Myers	1882
Eckford, Joseph William	1883
Tindall, Graham McFarland	1880

Fayette.

West, Howell Forman	1883

Greenville.

Finlay, John Pelham	1883

Holly Springs.

Athey, John Howard	1883

Jackson.

Ash, Matthew Franklin	1856

Port Gibson.

Shreve, John Alexander	1880

MISSOURI.

St. Louis.

Ahlbrant, Henry Ernst	1877
Alexander, Maurice William	1871
Ault, Charles Henry	1887
Blank, Alois	1881
Boehm, Solomon	1871
Catlin, Ephron	1871
Chamberlain, Guilford Tracy	1853
Curtman, Charles Otto	1871
Good, James Michener	1871
Grandjean, Charles	1871
Grandjean, Eugene	1871
Haigh, De Lagnel	1887
Hassebrock, Henry Fred	1884
Hemm, Francis	1881
Klie, George Henry Charles	1878
Leitch, Arthur	1860
Mallinckrodt, Edward	1869
Meyer, Christian Fred. Gottlieb	1860
Morley, William Jarman	1876
Pauley, Frank Charles	1879
Physick, Henry Sandford	1870
Richardson, James	1882
Richardson, Joseph Clifford	1871
Sander, Enno	1858
Scheffer, Henry William	1863
Sennewald, Ferdinand William	1865
Shorb, Joshua Eagan	1883
Tomfohrde, John William	1878
Ude, George	1871
Uhlich, Ferdinand G	1881
Vordich, August Henry	1874
Wall, Otto Augustus	1884
Westmann, Frank Henry	1882
Whelpley, Henry Milton	1887

Carl Junction.

Morgan, James	1859

Carrollton.

Pettit, Henry M	1860

Carthage.

Caffee, Amos Henry	1886

Glenwood.

Gray, Gilbert Dillon	1881

Hannibal.

Walker, Charles	1881

Independence.

Wight, Oscar Martin.	1887

Kansas City.

Arnold, Henry Clay	1881
Ford, William Thomas	1878
Gallagher, John Anthony	1881
Graham, Willis Hamm	1881
Lahme, Charles Adolph	1881
Love, Charles Edward	1881
Young, Judson J	1881

Macon.

Field, Amos	1871

Marshall.

Franklin, Philip Henry	1881

Mexico, Audrain Co.

Duncan, Thurston Baskett	1887
Llewellyn, John Frederick	1867

Rich Hill.

Youngs, William	1883

Sedalia.

Fleischmann, Augustus Theodore	1885

Weston.

Parr, John Conrad	1856

NEBRASKA.

North Bend.

Seykora, Edward Joseph	1887

Omaha.

Boyce, Samuel F 1871
Goodman, Charles Frederick 1871
Kennard, Frank Bartlett 1883
Kuhn, Norman Archibald 1878
Oleson Olaf Martin 1877

NEVADA.

Virginia City.

Perkins, William Alexander 1869

NEW HAMPSHIRE.

Claremont.

Spofford, Charles Byron 1884

Dover.

TUFTS, CHARLES AUGUSTUS 1856

Greenville.

Hall, Charles Edwin 1884

Manchester.

Miville, Francis Charles 1877
Perry, Bayard Taylor 1876

Nashua.

Russell. Elias Smith 1875
Whitman, Nelson Samuel 1875

New Market.

Dearborn, George Luther 1853

Portsmouth.

Preston, Andrew Peabody 1881
Thacher, Joseph Haven 1859

Rochester.

Sanderson, Stephen Francis 1880

Somersworth.

Moore, George 1859

Suncook.

Hildreth, Charles Francis 1874

NEW JERSEY.

Bloomfield.

Scherff, John Philip 1877

Bordentown.

Carslake, George Middleton 1880

Burlington.

Vandegrift, John A 1867

Camden.

Brown, Albert Potts 1870
Hutchison, Hazard Snowden 1885
Test, Alfred William 1870

East Orange.

Davis, George Randolph 1883
Niblo, William Henry 1887
Rumsey, Samuel Louis 1876

Elizabeth.

Brant, Edmund Wade 1882
Drake, Jonathan Baker 1875
Kent, Henry Avery, Jr 1880
Loveland, William F 1882
Oliver, William Murray 1875

Elizabethport.

Frohwein, Richard 1867

Englewood.

Rockefeller, Lucius 1880

Freehold.

Walker, Ansell 1880
Walker, John Putnam 1881

Hackensack.

Adams, Hazen Wooster 1879

Hoboken.

KLUSSMAN, HERMANN 1876

Jersey City.

Abernethy, Maxwell 1865
Dougherty, Samuel Edward . . . 1875
Turner, Isaac Worthington 1882
White, George Henderson 1868
Wienges, Conrad 1875

Keyport.

Warn, William Edgar 1886

Matawan, Monmouth Co.

Slater, Frank Hovey 1882

Medford.

Thorn, Henry Prickett 1879

Montclair.

Tobin, James Martin 1887

Morristown.

Carrell, Eugene Ayres 1875
Dalrymple, Charles Hoagland. . . . 1882

Mt. Holly.

WHITE, AARON SMITH	1860

Newark.

Betzler, Jacob	1880
Bruguier, Francis	1876
Drescher, August	1886
HOLZHAUER, CHARLES	1873
Sayre, Edward Augustus	1877
Sayre, William Henry	1877
Smith, Charles Bradley	1868
Smith, Israel Preston	1876
Stamford, William Harrison	1876
Van Winkle, Abraham	1871

New Brunswick.

Kilmer, Frederic Barnett	1886
Rust, William	1870

Newton.

Ryerson, Henry Ogden	1882

Orange.

Musler, Abram	1883
Parsons, Robert Edwin	1877

Orange Valley, Essex Co.

Yatman, John Lewis	1880

Plainfield.

Miller, Joseph Gilbert	1886
Reynolds, Howard Prescott	1875
Shaw, Robert Johnston	1875

Point Pleasant, Ocean Co.

Mangold, Gustavus Adolph	1875

Red Bank, Monmouth Co.

Nicholas, William Charles	1884

Roselle.

Tiernan, Frank Mortimer	1880

Salem.

Bassett, Joseph	1880

Somerville.

Cook, Gilbert Snowden	1886

South Amboy.

JACQUES, GEORGE WASHINGTON	1869

Trenton.

DeCou, James Clarke	1880

NEW MEXICO.

Las Vegas.

Zimmerman, John L.	1883

NEW YORK.

New York City.

Atwood, Herman White	1873
Balluff, Paul	1860
Balser, Gustavus	1875
Bedford, Peter Wendover	1859
Bendiner, Samuel Julius	1882
Billings, Henry Merry	1869
Campbell, Horace Willard	1875
Carle, John, Jr.	1860
Chandler, Charles Frederic	1867
Collins, Louis Dell	1880
Currie, John Harper	1858
Davis, Benjamin	1869
Dick, Dundas	1879
Ditman, Andrew Jackson	1868
Dudley, Oscar Earle	1877
Eimer, Charles	1872
Fairchild, Benjamin Thomas	1875
Fairchild, Samuel William	1887
Fink, Frederick William	1886
Fisher, William	1862
Fougera, Edmund Charles	1867
Foulke, James	1881
Fraser, Edward Allen	1873
Fuller, Henry Weld	1865
Gardner, Robert Winslow	1867
Gilmore, John Wesley	1872
Griffith, Albert Richard	1870
Hauenstein, William	1883
Haviland, Henry	1857
Hays, Benjamin Franklin	1886
Hays, David	1867
Hegeman, Johnson Niven	1880
Herzfeld, Herman	1885
Higgins, James Starkey	1862
Hoffmann, Frederick	1867
Hohenthal, Charles Frederick Leberecht	1865
Hudnut, Alexander	1857
Ihlefeld, Conrad Heinrich	1881
Jungmann, Julius	1879
Kalish, Julius	1875
Knapp, Frank Fiero	1880
Lawrence, John Herbert	1885
Lazell, Lewis Thurber	1858

Maclagan, Henry	1883
Macmahan, Thomas Jackson	1871
Main, Thomas Francis	1872
Massey, William Morton.	1885
McIntyre, Byron Floyd	1876
McIntyre, Ewen	1873
McKesson, John, Jr.	1867
Milhau, Edward Leon	1858
Molwitz, Ernest	1867
Morrison, Thomas Ormsby	1876
Neergaard, Sidney Herbert.	1880
O'Neil, Henry Maurice	1879
Osann, Bernhard	1882
Osmun, Charles Alvin	1868
Painter, Emlen	1870
Peixotto, Moses Levi Maduro	1869
Pfingsten, Gustavus	1873
Quackinbush, Benjamin Franklin	1886
Ramsperger, Gustavus	1860
Reichard, Frederick Alfred.	1871
Rice, Charles.	1870
Ricksecker, Theodore	1870
Robbins, Charles Albert	1876
Robbins, Daniel C.	1862
Sands, George Gedney.	1867
Schmid, Henry	1886
Schmidt, Ferdinand Traugott	1887
Scofield, James Stephen	1867
Seabury, George John	1876
Sheils, George Emanuel	1860
Skelly, James Joseph	1866
Starr, Thomas	1870
Tscheppe, Adolph.	1876
Tuska, David.	1881
Wanier, George Simon.	1876
Weinman, Oscar Christian	1873
Wichelus, Frederick.	1881
Wickham, William Hull	1870
Williams, Seward Whiting	1887
Wilson, William	1876
Wohlfarth, Justin	1879

Brooklyn.

Aspinall, Walter Albert	1880
Benjamin, James Henry	1878
Brooks, George Washington	1879
Close, George Cassidy	1858
Curtiss, Charles Grenville	1866
Cutts, Foxwell Curtis, Jr.	1875
Davis, William Mortimer	1879
Day, Carlos Erastus	1870
Daycock, William Henry	1874
DeForest, William Pendleton	1879
Dennin, Charles	1875
Douglas, Henry, Jr.	1875
Dunn, John Augustus	1867
Du Puy, Eugene	1852
Eccles, Robert Gibson	1885
Heydenreich, Emile.	1867
Jones, Thomas	1868
Kitchen, Charles William.	1865
Krieger, Philip	1876
Lehn, Louis	1874
Levy, Adolph	1877
Livingston, Barent Van Buren	1872
McElhenie. Thomas Diamond	1872
Menninger, Henry Joseph	1866
Newman, George Anthony	1865
Nicot, Louis Emile	1875
Niebrugge, John August	1861
Ollif, James Henry	1867
Owens, Richard John	1860
Post, Elisha	1876
Pyle, Cyrus	1859
Reiss, Edward Charles	1882
Reusch, Ernst	1882
Reynolds, Charles Edward	1882
Snyder, Ambrose Chancellor	1867
Squibb, Edward Hamilton	1882
Squibb, Edward R.	1858
Stevens, Luther Fuller	1879
Strachan, William Edward	1880
Tartis, Alfred Joseph	1867
Ubert, Julius	1876
Underhill, Joseph Garness	1879
Wackerbarth, John	1883
Wynn, William	1867
Zellhoefer, George	1876

Albany.

Clement, Henry Bratt	1880
French, William Barker	1880
Gaus, Charles Henry	1879
Gaus, Louis Henry	1880
Gibson, Charles H.	1880
Huested, Alfred Birch.	1879
McClure, Archibald	1880
McClure, William Henry.	1880
Michaelis, Gustavus	1882
Sauter, Louis	1879
Turner, George Heather	1880
Walker, William John	1880
Wheeler, Leonard Hiram	1883

Angola, Erie Co.	
Oatman, Le Roy Sutherland	1872
Penfold, Henry J	1882
Auburn.	
Stanley, Edgar Clark	1880
Au Sable Forks.	
Smith, Jay Hungerford	1883
Bergen.	
Fisher, Amos Sawyer	1880
Binghamton.	
Otis, Clark Zelotes	1886
Buffalo.	
Drefs, Charles Adams	1882
Gregory, Willis George	1886
Hayes, Horace Phillips	1880
Peabody, William Huntington	1857
Rano, Charles Orlando	1866
Catskill.	
Du Bois, William Laneman	1880
Mott, George Frederick	1880
Cornwall, Orange Co.	
Hazen, Peter Perry	1882
Croton Landing.	
Henry, Charles (Dworniczak)	1881
Elmira.	
Holmes, Clayton Wood	1873
Fishkill on Hudson.	
Moith, Augustus Theodore	1860
Flushing.	
Hepburn, John	1873
James, William Tefft	1882
Geneseo, Livingston Co.	
Rogers, Arthur Henry	1882
Gloversville, Fulton Co.	
Miller, Jason Albert	1879
Van Auken, Jerrie A	1880
Hannibal.	
Brewster, Wadsworth J	1880
Holley, Orleans Co.	
Bishop, Francis Myron	1882
Hudson.	
Richardson, Frank	1885
Hume, Alleghany Co.	
Hopper, George Smith	1881
Jamaica, Queens Co.	
Baylis, Lewis Fosdick	1880
Peck, George Lyman	1883
Johnstown.	
Cahill, John Francis	1880
Kingston.	
Dedrick, William Frederick	1884
Lockport.	
Sweet, Frederick K	1880
Malone.	
Miller, Robert McCleferty	1880
Middletown.	
KING, JAMES THEODORE	1859
Rogers, William Henry	1869
Mount Vernon.	
Gill, George	1872
Newburgh.	
Chapman, Isaac C.	1887
Niagara Falls.	
Griffith, Hiram Elijah	1875
Nyack, Rockland Co.	
De Graff, David	1879
Goodale, Harvey Galusha	1879
Olean.	
Coon, James Van Deventer	1880
Oswego.	
Butler, Charles Henry	1887
Port Chester.	
Hyler, William Henry	1875
Port Jervis.	
Cook, George Edward	1872
Potsdam.	
Thatcher, Harvey Dexter	1865
Richfield Springs.	
Smith, Willard Alfred	1880
Rochester.	
Aman, Henry	1882
Davis, Edward Hatch	1880
Haass, G. Herman	1872

Paine, James Dixon	1857
Schmitt, Joseph Max	1882
Smith, Willard	1880

Rome.

Bissell, John Gordon	1875
Owens, James Alanson	1882

Sag Harbor.

Tooker, William Wallace	1879

Sand Bank.

Rich, Willis Simmons	1882

Saratoga Springs.

Fish, Charles Frederick	1866
Mingay, James	1873
Pennington, Thomas Henry Sands	1877

Schenectady.

Davis, Edward Lansing	1881
Hanson, Willis Tracy	1880

Stapleton, S. I.

Feeny, James	1882

Stillwater, Saratoga Co.

Schermerhorn, Winfield Scott	1880

Syracuse.

Dawson, Edward Seymour, Jr.	1876
Snow, Charles Wesley	1876

Tonawanda, Erie Co.

Scoville, Charles Henry	1882

Utica.

Blaikie, William	1879
Cone, John Wright	1876

Warsaw.

Sweet, William Skiff	1882

Waterville, Oneida Co.

Bissell, Emery Gilbert	1879

Wellsville, Allegheny Co.

Hall, Edwin Bradford	1879

Yonkers.

Eschmann, Frederick William Rudolf	1880
Finkel, Charles Edwin	1880

NORTH CAROLINA.

Chapel Hill.

Saunders, Richard Banbury	1858

Durham, Orange Co.

Vaughan, Parry Wyche	1882

Fayetteville.

Hinsdale, Samuel Johnson	1875
Sedberry, Bond English	1882

Goldsboro.

Hatch, Eugene Francis	1883

Greensboro.

Porter, W. C	1880

Raleigh.

Lee, Addison Sherwin	1873
Simpson, William	1873

Statesville.

Munds, James Cassidy	1878

Tarboro.

Zoeller, Edward Victor	1878

Washington.

Gallagher, Charles Kewell	1857

Wilmington.

Harding, John Haywood	1881

OHIO.

Cincinnati.

Bain, Andrew Watson	1874
Betz, Otto Edward	1887
Crowther, Frederick Augustine	1887
DeLang, Alfred	1887
Eger, George	1864
Elfers, Joseph Clemens	1864
Feemster, Joseph Hall	1873
Fennel, Charles Theodore Piderit	1886
Goodman, Emanuel	1879
Gordon, William John Maclester	1854
Greve, Theodore Lund August	1864
Greyer, Julius	1880
Heineman, Otto	1864
Heun, Emil	1881
Hildreth, Newton Gough	1879
Hoffman, Julius	1887
JUDGE, JOHN FRENCH	1866
Karmann, William	1864
Klayer, Louis	1884
Koehnken, Herman Henry	1875
Lammert, Cyrus Joseph	1881
Lloyd, John Uri	1870
Martin, William James	1881

Meininger, Albert	1881
Merrell, George	1879
Norwood, Theodore Franklin	1887
Phillips, Charles Wilson	1881
Rendigs, Charles Peter	1876
Ruppert, John	1880
Sauer, Louis Wendlin	1882
Schreck, Leocadio Santos	1881
Serodino, Herman	1880
Simonson, William	1887
Stahlhuth, Ernst Henry William	1887
Vilter, Herman	1881
Voss, George William	1885
Wagner, Henry	1876
Walton, Harry Clifford	1881
Wells, Jacob David	1854
Weyer, John	1887
Yorston, Matthew Mackey	1864
Zuenkeler, John Ferdinand	1887

Akron.

Armstrong, Andrew Morehouse	1876
Smith, Joseph Stahle	1878
Inman, Charles Trask	1885

Bryan.

Snyder, Alva Leach	1873

Canton.

McFarland, Thaddeus Day	1887

Chillicothe.

Baumgartner, Frederick	1880
Howson, Arthur B	1886
Howson, Walter Henry	1875
Nipgen, John Alvin	1879

Circleville.

Evans, Samuel Barlow	1881

Cleveland.

Asplin, John Harding	1882
Bruce, James	1882
Cobb, Ralph Lathrop	1883
Dreher, Louis	1881
Feil, Joseph	1885
Fischer, Emil A	1887
Gaylord, Henry Cleveland	1869
Gegelein, Frederick Leonhardt	1881
Glines, George Walter	1881
Haber, Louis Anthony	1881
Hahn, Sigismund Joseph Frederick	1887
Hechler, George Louis	1882
Hopp, Louis Christopher	1876
Lehr, Philip	1885
May, Arthur Ferdinand	1881
Mayell, Alfred	1872
Myers, Daniel	1882
Parsons, Richard	1882
Rosenwasser, Nathan	1880
Schambs, George Matthias	1882
Schellentrager, Ernst August	1882
Scott, William Johnson	1872
Slosson, Frank West	1882
Smithnight, Albert	1882
Spenzer, Peter Ignatius	1872
Urban, Jacob Philip	1881

Columbiana.

Ink, Charles Elliott	1885

Columbus.

Bruck, Philip Henry	1884
Cook, Harry Clifford	1887
Herbst, Frederick William	1882
Hoffman, Otto Louis	1883
Huston, Charles	1872
Karb, George James	1883
Kauffman, George Beecher	1882
Schueller, Ernst	1881
Schueller, Frederick William	1880
Sherwood, Louis Walker	1882

Dayton.

Burkhardt, Mark Anthony	1887
Kurfurst, Henry F	1881
Vincent, Lorren Stiles	1887
Weusthoff, Otto Sittell	1879

Delhi, Hamilton Co.

Carpenter, Samuel William	1883

Delphos.

Wahmhoff, Julius Henry	1880

Gallipolis.

Schaaf, Justus Henry	1875

Grand Rapids, Wood Co.

Thurston, Azor	1886

Logan.

Harrington, Frank	1869

Massillon, Stark Co.

Baltzly, Zachariah Taylor	1876
Kirchhofer, Peter Paul	1881

Medina.

Albro, Willis Henry. 1887

Middletown.

Johnson, Charles Brayton 1876

Morristown.

Fisher, John Vance 1883

Navarre.

Grossklaus, John Ferdinand 1859

New Madison, Darke Co.

Hagemann, James F. S 1882

North Baltimore, Wood Co.

Clark, Frank P 1882

Salem, Columbiana Co.

Hawkins, Michael Smith. 1870

Springfield.

Casper, Thomas Jefferson 1867
Ludlow, Charles 1872
Siegenthaler, Harvey N 1882

Tiffin.

Fleck, Jacob J 1883
Marquardt, Jacob Frederick 1881

Toledo.

Hohley, Charles 1872
Reed, Isaac Newton. 1881

Troy.

Tobey, Charles William 1879

Washington Court House.

Boyer, Harry. 1887

Watertown.

Bohl, Conrad. 1881

Wooster.

Ohliger, Lewis Philip 1871

Zanesville.

Hatton, Edgar Melville 1878

OREGON.

Portland.

Sitton, Charles Edward 1878

PENNSYLVANIA.

Philadelphia.

Angney, John R 1867
Baker, Walter Theron 1885
Bauer, Louis Gustavus. 1867
Blair, Andrew 1865
Blair, Henry Cowen. 1868
Borell, Henry Augustus 1874
Boring, Edwin McCurdy. 1867
Bower, Henry 1860
Bower, Henry Albert 1868
Bullock, Charles 1857
Bunting, Samuel Sellers 1857
Campbell, Samuel 1864
Cook, Thomas Penrose. 1877
Dobbins, Edward Tompkins 1867
Eberle, Charles Louis 1865
Eddy, Henry Clay 1869
Ellis, Evan Tyson 1857
England, Robert 1868
Fox, Peter Paul. 1869
Fruh, Carl Daniel Stephan 1876
Gardner, Charles H 1881
Gerhard, Samuel 1873
Grahame, Israel Janney 1856
Grove, John Eberly 1868
Haenchen, Charles Eugene 1865
Hance, Edward H 1857
Hancock, Charles West 1868
Hassinger, Samuel Ellphat Reed . . 1880
Heintzelman, Joseph Augustus . . . 1858
Hoskinson, John Thomas, Jr 1881
Jenks, William J 1858
Jones, Alexander Henry 1874
Jones, Daniel Sexton. 1859
JONES, EDWARD CHARLES 1864
Keasbey, Henry Griffith 1873
Keeney, Caleb Reynolds. 1868
Keys, Roger 1868
Kline, Mahlon Norwood. 1876
Koch, Louis 1872
Krewson, William Egbert 1875
MAISCH, JOHN M. 1856
Mattison, Richard Vornselons. . . . 1873
McIntyre, William 1868
McKelway, George Irwin 1874
Mellor, Alfred 1864
Miller, Adolphus William 1868
Milligan, Decatur. 1867
Moore, Joachim Bonaparte 1860
Morris, Lemuel Iorwerth. 1880
Murray, Bernard James 1882
Murray, Francis Marion 1876
Newbold, Thomas Mitchell 1876
Ottinger, James Jeremiah 1876

Perot, Thomas Morris. 1857
Pile, Gustavus 1881
Preston, David 1868
Procter, Wallace 1874
REMINGTON, JOSEPH PRICE 1867
Riley, Charles William 1868
Rittenhouse, Henry Norman 1857
Robbins, Alonzo 1865
Roche, Edward Manning 1868
Rosengarten, Mitchell George . . . 1869
Shivers, Charles 1860
Shinn, James Thornton 1860
Shoemaker, Richard Martin 1869
Spannagel, Charles Christian 1874
Stryker, Cornelius Whitenack. . . . 1886
Taylor, Alfred Bower 1852
Thompson, William Beatty. 1858
Trimble, Henry 1876
Walch, Robert Henry 1879
Warner, William Richard. 1857
Webb, William Henry 1867
Weber, William 1872
Weidemann, Charles Alexander. . . 1868
Wendel, Henry Edward 1873
Wiegand, Thomas Snowdon 1857
Wright, Archibald Wesley 1868
Zeilin, John Henry 1859

Allegheny City.

Armor, Alpheus 1882
Eggers, Frederick Hermann 1872
Keck, William Hugus. 1885
Slocum, Frank Leroy 1880

Allentown.

Klump, Charles Christian 1880

Beaver, Beaver Co.

Andriessen, Hugo 1875

Bellefonte, Centre Co.

Zeller, William Samuel 1881

Bristol.

Pursell, Howard 1880
Young, John Kroesen 1887

Carlisle.

Horn, Wilbur Fisk 1876

Centralia.

Finnerty, Edward John, Jr 1887

Chambersburg.

Cressler, Charles Henry 1868

Columbia.

Meyers, James Alfred 1867

Derry Station.

Thomas, George Massena 1883

Easton.

Weaver, John Archibald 1873

Franklin.

Riesenman, Joseph 1883

Hanover, York Co.

Eckert, Edwin Gilbert. 1883
Sniveley, Andrew Jackson 1883

Harrisburg.

George, Charles Theodore 1873
Gorgas, George Albert. 1884
Gross, Edward Ziegler. 1883
Miller, Jacob Augustus 1873
Weills, William Melanchthon Luther. 1885

Hyde Park, Scranton, Luzerne Co.

Morgan, Benjamin George 1876

Lancaster.

HEINITSH, CHARLES AUGUSTUS. . . 1857

Lebanon.

LEMBERGER, JOSEPH LYON 1858
Redsecker, Jacob Henry 1881

Lock Haven.

Prieson, Adolph 1880

McKeesport.

Pritchard, Benjamin Elliott. 1885

Mansfield, Tioga Co.

Ridgway Lemuel Augustus 1882

Milton.

Alleman, Emanuel Allison 1880

Minersville.

Burns, John Kellar 1876

New Brighton.

Walker, Francis William, Jr 1878

Norristown.

Poley, Francis Henry 1880
Stahler, William 1880

Oil City.

Krosskop, William Burton 1887

Osceola Mills.

Campbell, Hugh	1876

Pittsburgh.

Beach, Clifton Hilliard	1883
Cherry, James Bonbright	1868
Emanuel, Louis	1878
Holland, Samuel Smith	1876
Kelly, George Armstrong	1882
Kerr, James, Jr.	1876
Nisbet, William Washington	1883
Robertson, Archibald Craig	1882
Schneider, Mathias Martin	1883
Stevens, Salmon Henry	1885
Todd, William James	1885
Wilson, Albert Hemphill	1883

Pittston.

Rhoades, Stephen Howard	1876

Pottsville.

Deibert, Thomas Irvin	1882
Kennedy, George Washington	1869

Reading.

Fox, Daniel Soder	1872
Raser, John Bernard	1872
Smith, Stephen Douglas	1883
Stein, Jacob Henry	1869
Ziegler, Philip Milton	1867

Scottdale, Westmoreland Co.

Cummings, Theodore Foster	1882
Hodgkins, Israel Marion	1887
McNeil, John Murray	1882

Shamokin.

Smink, William Henry R.	1885

Shenandoah, Schuylkill Co.

McCarthy, Cornelius Joseph	1886

Shippensburg.

Fleming, Frank Byerly	1883

Towanda.

Porter, Henry Carroll	1880

West Chester.

Evans, Joseph Spragg	1877

White Haven.

Driggs, Charles M.	1881

Wilkes-Barre.

Jones, Samuel Stephen	1887
Wolfe, Nathaniel	1878

Williamsport.

Cornell, Edward Augustus	1873
Duble, Jesse Balderston	1870
Hill, Justin Luther	1887

York.

Patton, John Franklin	1880

RHODE ISLAND.

Newport.

Cotton, William Henry	1885
Downing, Benjamin Franklin, Jr.	1886
Taylor, James Henry	1875

Pawtucket.

Jillson, Frederick Winfield	1887

Providence.

Alfreds, Henry James	1883
Blanding, William Bullock	1875
Calder, Albert Layton	1859
Danforth, Edmund Culver	1878
Dolloff, Albert Simeon	1886
Greene, William Ray	1883
Leith, Harvey Isaac	1883
Mason, Norman Nelson	1875
Reynolds, William Keyes	1876
Walling Walter Augustus	1886
Wellington, Arthur Wellesley	1886
Wood, Mason B	1882

Westerley.

Collins, Albert Burlingame	1882

SOUTH CAROLINA.

Charleston.

Aimar, Charles Pons	1879
Burnham, Edward Steinmeyer	1874
Eckel, Augustus William	1874
Luhn, Gustavus Johann	1873
Marsteller, George Ludwig	1883
Michaelis, Charles Otto	1874
Panknin, Charles Frederick	1874

Columbia.

Thomas, Oscar Ernest	1882

TENNESSEE.

Chattanooga.

Carraway, Davis Stephen	1887

Memphis.

Robinson, James Scott	1869

Nashville.

Burge, James Oscar	1878
Laurent, Eugene Leonard	1872
Roscoe, Lucius	1887
Thomas, James, Jr.	1875
Watson, William Harry	1887
Wharton, John Criddle	1872
Wharton, William Henry	1876

TEXAS.

El Paso.

Irvin, William Armstrong	1879

Fort Worth.

Harper, Harry Winston	1881
Powell, Thomas Wallace	1874
Wells, Ebenezer Miller	1878

Galveston.

Preston, Calvin Walbridge	1884

Marshall.

Lancaster, Edwin Walter	1884

San Antonio.

Kennedy, James	1887

Waco.

King, Walter Blackburn	1883

VERMONT.

Brandon.

Crossman, George Alvin	1872

Chester.

Pierce, Frederick Webster	1879

Morrisville.

Gates, Amasa O.	1876

St. Johnsbury.

Bingham, Charles Calvin	1875
Randall, George Dallas	1875

White River Junction.

Trask, Charles Mitchell	1875

Windsor.

Paine, Milton Kendall	1875

VIRGINIA.

Danville.

Cole, Howson White	1882
Wiseman, Henry Adolphus	1883

Fredericksburg.

Hall, Marshall Carter	1870

Norfolk.

Jackson, Edward Calvert	1883
Masi, Frederick Henry	1873

Petersburg.

Beckwith, Edward Ruffin	1886
Knock, Thomas Franklin	1882

Richmond.

Baker, Thomas Roberts	1873
Scott, William Henry	1873

WASHINGTON TERRITORY.

Seattle.

Kellogg, Gardner	1882

Walla Walla.

Holmes, Henry Elliott	1880

WEST VIRGINIA.

Charleston, Kanawha Co.

Boggs, Edwin Leslie	1872
Potterfield, Clarence Asbury	1882

Parkersburg.

Williams, Alfred Neveth	1883

Wheeling.

Bocking, Edmund	1874
Gray, William Howlett	1880
Menkemeller, Charles	1880
Williams, William Hudson	1880
Young, Alexander Thomas	1876

WISCONSIN.

Beloit.

Fenton, Franklin Sprague	1881

Eau Claire.

Godding, Edward Robert	1884

Fond du Lac.

Huber, Jacob Charles	1880

Fountain City.

Bechman, Charles Richard	1882

Janesville.

Prentice, Fred F	1876

Lake Geneva.

Arnold, Robert Bruce	1879
Miner, Morris Ashbel	1880

La Crosse.

Beyschlag, Charles	1880

Madison.

Hollister, Albert Henry	1884
Power, Frederick Belding	1872

Mayville, Dodge Co.

Sauerhering, Rudolph Aurelius	1884

Milwaukee.

Abbott, Frank	1880
Conrath, Adam	1881
Crolius, Frank Marcelous	1884
Dadd, John Alfred	1880
Drake, John Ransom	1860
Kienth, Hans	1884
Kremers, Edward	1887
Schrank, Charles Henry	1876
Senier, Frederick Sutherland	1874

Neillsville.

Sniteman, Charles Clarence	1881

Watertown.

Eberle, Herman Theodore	1875

DOMINION OF CANADA.

BRITISH COLUMBIA.

New Westminster.

Coffin, Samuel Lockwood	1879

NOVA SCOTIA.

Halifax.

Simson, Francis Cook	1876

Kentville.

Masters, Robert Silas	1883

Pictou.

Fraser, Robert Peden	1885

ONTARIO.

Goodrich.

Jordon, Frederick Francis	1877

Lindsay.

Gregory, Edmund	1875

Ottawa.

Saunders, William	1860

St. Thomas.

Foster, William Orrville	1881

Stratford.

Waugh, George James	1862

Toronto.

Lander, John Cambridge	1877
Lowden, John	1875
Robinson, William Sherlock	1877

PRINCE EDWARD ISLAND.

Charlottetown.

Dodd, Simon Walker	1884

QUEBEC.

Montreal.

Gray, Henry Robert	1867
Mason, Alfred Henry	1884

Quebec.

McLeod, Roderick	1880

Three Rivers.

Williams, Richard Wellington	1883

BERMUDA.

Hamilton.

Heyl, James B.	1863

MEMBERS RESIDING IN EUROPE.

Burroughs, Silas Mainvielle, London, England	1876
Coblentz, Virgil, Göttingen, Germany	1882
Maisch, Henry Charles Christian, Göttingen, Germany	1885
Wellcome, Henry Solomon, London, England	1875

MEMBERS WHOSE RESIDENCE IS UNKNOWN.

Clapp, Chambers Brown	1883
Genois, Louis	1876
Hale, Frederick	1855
Risk, Clarence Henderson	1882
Rose, Henry John	1873

ALPHABETICAL LIST OF MEMBERS.

HONORARY MEMBERS.

Attfield, Dr. John, Professor of Practical Chemistry to the Pharmaceutical Society of Great Britain, 17 Bloomsbury Square, London, W. C., England.

Bentley, Dr. Robert, Emeritus Professor of Materia Medica and Botany to the Pharmaceutical Society of Great Britain, 17 Bloomsbury Square, London, W. C., England.

Brady, Henry B., F. R. S., 29 Mosley Street, Newcastle-upon-Tyne, England.

Brunnengraeber. Dr. Christian, Rostock, Germany.

Carteighe, Michael, F. I. C., 180 New Bond Street, London, W., England.

De Meyer, A. T., Bruxelles, Belgium.

De Vrij, Dr. J. E., 54 Heerengracht, the Hague, Netherlands.

Dragendorff, Dr. G., Professor of Pharmacy at the University of Dorpat, Russia.

Duflos, Dr. Adolph, Professor, Annaberg, Germany.

Flückiger, Dr. Frederick A , Professor in the University of Strassburg, Germany.

Gille, Norbert, Professor in the École Vétérinaire de l'Etat, Bruxelles, Belgium.

Greenish, Thomas, F. C. S., 20 New Street, Dorset Square, London, N. W., England.

Hager, Dr. Hermann, Pulvermühle bei Fürstenberg, Germany.

Ince, Joseph, F. L. S., 11 St. Stephen's Avenue, Shepherd's Bush, W., London, England.

Martenson, Magister J. von, Kinderhospital des Prinzen von Oldenburg, St. Petersburg, Russia.

Planchon, Dr. G., Professor, Paris, France.

Redwood, Dr. Theophilus, Professor of Pharmacy to the Pharmaceutical Society of Great Britain, 17 Bloomsbury Square, London, W. C., England.

Reynolds, Richard, F. C. S., Cliff Lodge, Hyde Park, Leeds, England.

Sanford, George W., 47 Piccadilly, London, W., England.

Schacht, Dr. Carl, 56 Mittelstrasse, Berlin, N. W., Germany, England.

Schacht, George F., F. C. S., 52 Royal York Cresct., Clifton. Bristol, England.

Schaer, Dr. Edward, Professor of Pharmacy, Zurich, Switzerland.

Soubeiran, Dr. J. Léon, Professor of Pharmacy, École de Pharmacie, Montpellier, France.

Waldheim, Anton von, 17 Himmelpfortgasse, Wien, I., Austria.

ACTIVE MEMBERS.

Abbott, Frank, No. 407 E. Water street, Milwaukee, Wis.

Abernethy, Maxwell, No. 188 Newark avenue, Jersey City, N. J.

Adams, Hazen W., No. 73 Main street, Hackensack, N. J.

Ade, Samuel G., No. 126 Milwaukee avenue, Chicago, Ill.

Ahlbrandt, Henry E., Fifteenth and Carr streets, St. Louis, Mo.

Aimar, Charles P., No. 469 King street, Charleston, S. C.

Aird, William, Bay and Julia streets, Jacksonville, Fla.

Albro, Willis H., Medina, O.

Alexander, Maurice W., Broadway and Olive streets, St. Louis, Mo.

Alfreds, Henry J., No. 311 Eddy street, Providence, R. I.

Alleman, Emanuel A., 160 S. Front street, Milton, Pa.

Allen, Albert W., Detroit, Mich.

Allen, E. Floyd, No. 1020 Hennepin avenue, Minneapolis, Minn.

Aman, Henry, No. 167 North Clinton street, Rochester, N. Y.

Anderson, Samuel, No. 48 Front street, Bath, Me.

Andrews, Josiah H., Chestnut and Second streets, Seymour, Ind.

Andriessen, Hugo, P. O. Box 39, Beaver, Beaver county, Pa.

Angney, John R., Fifth and Spruce streets, Philadelphia, Pa.

Appleton, Henry K., Jr., 257 Columbus avenue, Boston, Mass.

Armor, Alpheus, No. 57 Taylor avenue, Allegheny City, Pa.

Armstrong, Andrew M., No. 106 East Market street, Akron, O.

Arnold, Henry C., No. 428 Main street, Kansas City, Mo.

Arnold, Robert B., Main and Broad streets, Lake Geneva, Wis.

Ash, Matthew F., P. O. Box 129, Jackson, Miss.

Aspinall, Walter A., Nos. 1147 and 1149 Fulton street, Brooklyn, N. Y.

Asplin, John H., No. 227 Prospect street, Cleveland, O.

Athey, J. Howard, Holly Springs, Miss.

Atwood, Herman W., No. 846 Broadway, New York, N. Y.

Atwood, Luther L., No. 7 North street, Pittsfield, Mass.

Ault, Charles H., 2921 Manchester Road, St. Louis, Mo.

Averill, William H., No. 435 Main street, Frankfort, Ky.

Babo, Leopold, No. 12 Boylston street, Boston, Mass.

Baier, Charles G., 326 Gratiot avenue, Detroit, Mich.

Bailey, Frederick, P. O. Box 314, Lowell, Mass.

Bain, Andrew W., City Hospital, Cincinnati, O.

Baker, Edwin, Bridge street, Shelburne Falls, Mass.

Baker, T. Roberts, No. 919 East Main street, Richmond, Va.

Baker, Walter T., No. 1201 Chestnut street, Philadelphia, Pa.

Ball, Charles E., No. 221 High street, Holyoke, Mass.

Ballard, John W., No. 106 West Second street, Davenport, Iowa.

Balluff, Paul, No. 632 Sixth avenue, New York.

Balser, Gustavus, 137 Avenue B, New York.

Baltzley, Zacharias T., Opera Block, Massillon, O.

Barnum, Joseph P., 543 Fourth avenue, Louisville, Ky.

Bartells, George C., 130 East State street, Camp Point, Ill.

Bartlett, Nicholas G., Twenty-third street and Indiana avenue, Chicago, Ill.

Bartlet, William W., No. 675 Shawmut avenue, Boston, Mass.

Bassett, Charles H., No. 504 Washington street, Boston, Mass.

Bassett, Joseph, No. 119 Market street, Salem, N. J.

Bauer, Louis G., Fifth street and Fairmount avenue, Philadelphia, Pa.

Baumgartner, Frederick, Hotel Carlon Block, Chillicothe, O.

Baur, Jacob, 701 Main Street, Terre Haute, Ind.

Baxley, J. Brown, Howard and Franklin streets, Baltimore, Md.

Bayley, Augustus R.. No. 607 Main street, Cambridgeport, Mass.

Bayliss, Lewis F., P. O. Box 34, Jamaica, Queen county, L. I., N. Y.

Beach, Clifton H., Shiloh and Sycamore streets, Pittsburgh, Pa.

Bechmann, Charles R., Fountain City, Wis.

Beckett, Frederick A., No. 529 Market street, San Francisco, Cal.

Beckman, Oscar A., No. 686 Broadway, cor. Baxter avenue, Louisville, Ky.

Beckwith, Edward R., Sycamore street, Petersburg, Va.

Bedford, P. Wendover, P. O. Box 1807, New York, N. Y.

Behre, Charles H. E., Schumann's Pharmacy, Atlanta, Ga.

Belt, Z. James, No. 601 Market street, Wilmington, Del.

Bendiner, Samuel J., No. 47 Third avenue, New York, N. Y.

Benedict, Willis, No. 303 Congress avenue, New Haven, Conn.

Benjamin, James H., No. 493 Tompkins avenue, Brooklyn, N. Y.

Berrian, George W., N. Andover, Mass.

Best, John, No. 1 German Block, Central City, Col.

Betz, Otto E., 36 Eastern avenue, Cincinnati, O.

Betzler, Jacob, No. 121 Union street, Newark, N. J.

Beyschlag, Charles, 503 Main street, La Crosse, Wis.

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Bingham, Charles C., No. 5 Bank Block, Main street, St. Johnsbury, Vt.

BIROTH, HENRY, No. 111 Archer avenue, Chicago, Ill.

Bishop, Francis M., Public Square, Holly, Orleans county, N. Y.

Bissell, Emery G., Main street, Waterville, Oneida county, N. Y.

Bissell, John G., No. 45 Dominick street, Rome, N. Y.

Blahnik, Lorenz, No. 88 West Eighteenth street, Chicago, Ill.

Blaikie, William, No. 202 Genesee street, Utica, N. Y.

Blair, Andrew, Eighth and Walnut streets, Philadelphia, Pa.

Blair, Henry C., Eighth and Walnut streets, Philadelphia, Pa.

Blake, James E., No. 64 North Second street, New Bedford, Mass.

Blanding, William B., Nos. 54 and 58 Weybosset street, Providence, R. I.

Blank, Alois, No. 1353 South Fifth street, St., Louis, Mo.

Blatchford, Eben, No. 32 Main street, Rockport, Mass.

Blocki, William F., No. 85 South Clark street, Chicago, Ill.

Bocking, Edmund, No. 1 Odd Fellows' Hall, Wheeling, W. Va.

Bodemann, Wilhelm, 239 State street, Chicago, Ill.

Boehm, Solomon, No. 800 Morgan street, St. Louis, Mo.

Boerner, Emil L., Clinton street, Iowa City, Iowa.

Boggs, Edwin L., Kanawha Bank Building, Charleston, Kanawha county, W. Va.

Bohl, Conrad, Watertown, O.

Bolles, William P., Hotel Warren, Warren street, Boston, Mass.

Bond, John B.. Main and Fifth streets, Little Rock, Ark.

Bond, Sterling P., Main and Fifth streets, Little Rock, Ark.

Borell, Henry A., No. 2043 Chestnut street, Philadelphia, Pa.

Boring, Edwin M., Tenth street and Fairmount avenue, Philadelphia, Pa.

Bower, Henry, Gray's Ferry road and Twenty-ninth street, Philadelphia, Pa.

Bower, Henry A., Sixth and Green streets, Philadelphia, Pa.

Bowker, James, Sixth and Vine streets, Philadelphia, Pa.

Boyce, Samuel F., 1007 Jones street, Omaha, Neb.

Boyd, George W., C street, N. E., between

Second and Third streets, Washington, D. C.

Boyden, Edward C., Joy and Myrtle streets, Boston, Mass.

Boyer, Harry, Washington Court House, O.

Boynton, Herschell, No. 74 Main street, Biddeford, Maine.

Brack, Charles, Ensor and Forrest streets, Baltimore, Md.

Brackett, Aurick S., No. 142 Montgomery street, San Francisco, Cal.

Bradfield, Louis H., Decatur and Pryor streets, Atlanta, Ga.

Brant, Edmund W., No. 292 Broad street, Elizabeth, N. J.

Brewster, Wadsworth J., Hannibal, N. Y.

Bristol, Charles E., No. 48 Main street, Ansonia, Conn.

Brooks, Francis M., Main street, Baton Rouge, La.

Brooks, George W., No. 1161 Myrtle avenue, Brooklyn, N. Y.

Brown, Albert E., Conception and Canal streets, Mobile, Ala.

Brown, Albert P., Fifth and Federal streets, Camden, N. J.

Brown, Henry J., No. 2 Main street, Ann Arbor, Mich.

Brown, Robert J., No 113 Delaware street, Leavenworth, Kan.

Browne, Clarence E., West Medford, Mass.

Browning, Woodville, No. 364 Blake street, Indianapolis, Ind.

Bruce, James, No. 544 Prospect street, Cleveland, O.

Bruck, Philip H., No. 24 N. High street, Columbus, O.

Brugnier, Francis, No. 557 Market street, Newark, N. J.

Brunner, Norman I., Fourth and Arch streets, Macon, Ga.

Brunswig, Lucien N., Magazine and Gravier streets, New Orleans, La.

Bryant, Randolph F., Lincoln, Kan.

Bryant, William C., No. 123 Main street, Cedar Falls, Black Hawk county, Ia.

Buck, Albert B., Anderson, Ind.

Buck, George, State and Madison streets, Chicago, Ill.

Buck, John, No. 267 Broadway, Chelsea, Mass.

Buck, John L., No. 267 Broadway, Chelsea, Mass.

Buffington, Cyrus A., Hotel Block, Indianola, Ia.

Bullock, Charles, No. 528 Arch street, Philadelphia, Pa.

Bunker, Elihu, No. 403 Purchase street, New Bedford, Mass.

Buntin, William C., No. 600 Main street, Terre Haute, Ind.

Bunting, Samuel S., 145 N. Tenth street, Philadelphia Pa.

Burge, James O., Broad and Market streets, Nashville, Tenn.

Burkhardt, Mark A., Third and St. Clair streets, Dayton, O.

Burley, Edwin P., No. 43 Temple Place, Boston, Mass.

Burnett, Joseph, 27 Central st. Boston, Mass.

Burnham, Edward S., 369 King street, Charleston, S C.

Burns, J. Kellar, Sunbury and Lecona streets, Minersville, Pa.

Burrough, Horace, 92 Camden street, Baltimore, Md.

Burroughs, Silas M., 8 Snow Hill, London, England.

Bury, Edward B., No. 412 Eighth street, S. E., Washington, D. C.

Bush, William, No. 56 Front street, Worcester, Mass.

Butler, Charles H., 182 W. First street, Oswego, N. Y.

Butler, Freeman H., No. 141 Central street, Lowell, Mass.

Butler, George F., 18 Fifth Avenue, Belle Plaine, Kan.

Button, Charles E., No. 1558 Wabash avenue, Chicago, Ill.

Cabell, George W., No. 211 Central avenue, Hot Springs, Ark.

Caffee, Amos H., Carthage, Mo.

Cahill, John F., No. 119 Main street, Johnstown, N. Y.

Calder, Albert L., No. 163 Westminster street, Providence, R. I.

Caldwell, James W., No. 242 Grand River avenue, Detroit, Mich.

Calvert, John, Kearney and Clay streets, San Francisco, Cal.

Campbell, Horace W., No. 84 Front street, New York, N Y

Campell, Hugh, Osceola Mills, Pa.

Campbell, Samuel, No. 1416 Walnut street, Philadelphia, Pa.

Candidus, Philip C., Dauphin and Cedar streets, Mobile Ala.

CANNING, HENRY, No. 109 Green street, Boston, Mass.

Carle, John, Jr., No. 153 Water street, New York, N. Y.

Carpenter, Samuel W., Washington and Lincoln streets, Delhi, Hamilton county, O.

Carraway, Davis S., 21 E. Seventh street, Chattanooga, Tenn.

Carrell, Eugene A., Washington street, Morristown, N. J.

Carslake, George M., Farnsworth and Church Streets, Bordentown, N J.

Carter, Solomon, No. 356 Washington street, Boston, Mass.

Caspari, Charles, Jr., Fremont and Baltimore streets, Baltimore, Md.

Casper, Thomas J., No. 41 East Main street, Springfield, O.

Catlin, Ephron, Sixth street and Washington avenue, St. Louis, Mo.

Chalin, Louis F., Carrolton and St. Charles avenues, New Orleans, La.

Chamberlain, Guilford T., Ninth and Chambers streets, St. Louis, Mo.

Chandler, Charles F., Fourth avenue and Fiftieth street, New York, N. Y.

Chapin. Fred. H., No. 259 Main street, Hartford, Conn.

Chapin, William A., Beach and Lincoln streets, Boston, Mass.

Chapman, Isaac C., No. 111 Water street, Newburgh, N. Y.

Cherry, James B., No. 23 Fourth avenue, Pittsburgh, Pa.

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Christiani, Charles, No. 484 Pennsylvania avenue, Washington, D. C.

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Clark, Frank P., North Baltimore, Wood county, O.

Clarke, William B., Main street, Clarke's Block, Stockbridge, Mass.

Clement, Henry B., Nos. 684 and 686 Broadway, Albany, N. Y.

Close, George C., 67 Cumberland street, Brooklyn, N. Y.

Cobb, Ralph L., No. 112 Superior street, Cleveland, O.

Coblentz, Virgil, No. 3 A Judenstrasse, Göttingen, Germany.

Coffin, Samuel L., New Westminster, British Columbia.

Colcord, Joseph W., No. 153 Union street, Lynn, Mass.

Colcord, Samuel M., Dover, Mass.

Cole, Howson W., No. 66 Main street, Danville, Va.

Colgan, John, Tenth and Walnut streets, Louisville, Ky.

Collins, Albert B., No. 48 Main street, Westerly, R. I.

Collins, Louis D., No. 280 Greenwich street, New York, N. Y.

Collins, Richard D., Crittenden, Grant county, Ky.

Colton, James B., No. 766 Tremont street, Boston, Mass.

Cone, John W., No. 205 Genesee street, Utica, N. Y.

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Cook, George E., No. 111 Pike street, Port Jervis, N. Y.

Cook, Gilbert S., Somerville. N. J.

Cook, Harry C., 1015 N. High street, Columbus, O.

Cook, Thomas P., No. 838 North Ninth street, Philadelphia, Pa.

Coon, James V. D., No. 31 Union street, Olean, N. Y.

Cordon, John G. M., Main street, Aberdeen, Miss.

Cornell, Edward A., Pine and Tenth streets, Williamsport, Pa.

Cotton, William H., No. 226 Thames street, Newport, R. I.

Coumbe, Oscar H., Tenth and E streets, N. W., Washington, D. C.

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Cummings, Theodore F., 107 Pittsburgh street, Scottdale, Westmoreland co., Pa.

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Dana, Edmund, Jr., No. 373 Congress stteet, Portland, Me.

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Darrough, Charles H., Main street, Red Bluff, Cal.

Davenport, Bennett F., No. 751 Tremont street, Boston, Mass.

Davis, Benjamin, No. 466 Grand street, New York, N. Y.

Davis, Edward H., No. 101 State street, Rochester, N. Y.

Davis, Edward L., Union and Bates streets, Schenectady, N. Y.

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Day, Carlos E., No. 1002 Broadway, Brooklyn, N. Y.

Day, Charles W., Springfield, Ill.

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De Forest, William P., 530 Macon street, Brooklyn, N. Y.

De Graff, David, No. 3 Broadway, Nyack, Rockland county, N. Y.

De Huy, Bernard H., Second and Spruce streets, Abilene, Kan.

De Lang, Alfred, Broadway and Fourth street, Cincinnati, O.

Dearborn, George L., No. 156 Main street, New Market, N. H.

Dedrick, Wm. Fred., No. 28 Wall street, Kingston, N. Y.

Deibert, Thomas I., No. 103 North Centre street, Pottsville. Pa.

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Deléry, Edgar, Dauphin and Kerlerec streets, New Orleans, La.

Denham, Charles S., Main street, East Pepperell, Mass.

Dennin, Charles, No. 383 Court street, Brooklyn, N. Y.

Devine, John, Kearney and Clay streets, San Francisco, Cal.

Dewoody, William L., Pine Bluff, Jefferson county, Ark.

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Dodd, Simon W., 101 Queen street, Charlottestown, P. E. I.

Dohme, Charles E., Pratt and Howard streets, Baltimore, Md.

Dohme, Louis, Pratt and Howard streets, Baltimore, Md.

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Drake, Jonathan B., No. 132 Broad street, Elizabeth, N. J.

Drake, John R., No. 365 S. Water street, Milwaukee, Wis.

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Dreher, Louis, No. 302 Euclid avenue, Cleveland, O.

Drescher, August, No. 108 Bowery street, Newark, N. J.

Dresser, George E., Main st., Putnam, Conn.

Driggs, Charles M., Railroad and Berwick streets, White Haven, Pa.

Driggs, Nathaniel S., Indianapolis, Ind.

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DRURY, LINUS D., Warren and Dudley streets, Boston, Mass.

Duble, Jesse B., Pan and Fourth streets, Williamsport, Pa.

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Duncan, Thurston B., Public Square, Mexico, Andrain county, Mo.

Dunn, John A., No. 56 Dougherty street, Brooklyn, N. Y.

Dupont, William, 182 Michigan avenue Detroit, Mich.

Durban, Sebastian C. No. 708 Broad street, Augusta, Ga.

Durkee, William C., Boylston and Berkeley streets, Boston, Mass.

Easton, Luther W., Union near Webster street, Rockland, Mass.

Eberbach, Ottmar, No. 12 South Main street, Ann Arbor, Mich.

Eberhardt, Ernest G., 518 South New Jersey street, Indianapolis, Ind.

Eberle, Charles L., No. 4779 Germantown avenue, Philadelphia, Pa.

Eberle, Herman T., care G. E. Eberle & Son, Watertown, Wis.

EBERT, ALBERT E., No. 426 State street, Chicago, Ill.

Eccles, Robert G., No. 94 Smith street, Brooklyn, N. Y,

Eckel, Augustus W., No. 231 King street, Charleston, S. C.

Eckert, Edwin G., High and Frederick streets, Hanover, Pa.

Eckford, Joseph Wm., Commerce street, Aberdeen, Miss.

Eddy, Henry C., Eighteenth and Lombard streets, Philadelphia, Pa.

Edwards, Nathan W., Main street, Fairmount, Ind.

Edwards, William F., No. 334 East Baltimore street, Baltimore, Md.

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Eggers, Frederick H., No. 72 East Ohio street, Allegheny City, Pa.

Eimer, Charles, No. 130 East Eighteenth street, New York, N. Y.

Elbe, Constantine B., Park street, Alameda, Cal.

Elfers, Joseph C., Plum and Longworth streets, Cincinnati, O.

Eliel, Leo, No. 101 Main street, South Bend, Ind.

Elliott, Henry A., No. 286 Lexington street, Baltimore, Md.

Ellis, Evan T., No. 145 South Front street, Philadelphia, Pa.

Emanuel, Louis, Second and Grant streets, Pittsburgh, Pa.

Emerson, Charles B., Merrimac and Bridge streets, Haverhill, Mass.
Emich, Columbus V., No. 423 North Howard street, Baltimore. Md.
England, Robert, No. 800 South Tenth street, Philadelphia, Pa.
Eschmann, F. W. R., P. O. Box 875, Yonkers, N. Y.
Estabrook, Henry A., Fitchburg, Mass.
Estes, Joseph J., Union and Church streets, Rockland, Mass.
Evans, Joseph S., P. O. Box 657, West Chester, Pa.
Evans, Samuel B., No. 275 Main street, Circleville, O.
Fairchild, Benjamin T., No. 60 Fulton street, New York, N. Y.
Fairchild, Samuel W., No. 82 Fulton street, New York, N. Y.
Feemster, Joseph H., No. 99 Walnut street, Cincinnati, O.
Feeny, James, Bay and Thompson streets, Stapleton, S. I., N. Y.
Feil, Joseph, Cleveland, O.
Fennel, Charles T. P., Eighth and Vine streets, Cincinnati, O.
Fenner, William R., care of W. D. Hoyt & Co., Rome, Ga.
Fenton, Frank S., W. Bridge street, Beloit, Wis.
Fickling, Charles H., No. 1260 Thirty-second street, West Washington, D. C.
Field, Amos, No. 26 Vine st., Macon, Mo.
Fink, Frederick Wm., No. 128 William street, New York, N. Y.
Finkel, Charles E., No. 4 Main street, Yonkers, N. Y.
Finlay, Alexander K., No. 186 Camp street, New Orleans, La.
Finlay, John P., Washington and Mulberry streets, Greenville, Miss.
Finnerty, Edward J., Jr., Locust ave., Centralia, Pa.
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Fischer, Phil., No. 848 West Market street, Louisville, Ky.
Fish, Charles F., No. 104 Broadway, Saratoga Springs, N. Y.
Fisher, Amos S., Lake St., Bergen, N. Y.
Fisher, John V., Odd Fellows' Hall, Morristown, O.
Fisher, William, No. 327 Bleeker street, New York, N. Y.
Flanagan, Lewis C., No. 589 Somerville avenue, Somerville, Mass.
Fleck, Jacob J., Washington and Perry streets, Tiffin, O.
Fleischmann, Augustus T., Sedalia, Mo.
Fleming, Frank B., No. 7 West Main street, Shippensburg, Pa.
Ford, Charles M., No. 700 Fifteenth street, Denver, Col,
Ford, W. Thomas, No., 1305 Cherry street, Kansas City, Mo.
Foster, William O., No. 221 Talbot street, St. Thomas, Ontario, Can.
Fougera, Edmund C., Broadway and Thirtieth street, New York, N. Y.
Foulke, James, No. 91 Fulton street, New York, N. Y.
Fox, Daniel S., No. 323 Franklin street, Reading, Pa.
Fox, Peter P., Woodland avenue and Seventy-third street, Philadelphia, Pa.
Frames, James P., Gray and Aisquith streets, Baltimore, Md.
Francis, Walter R., No. 170 Orange street, New Haven, Conn.
Franklin, Philip H., N. side Public Square, Marshall, Mo.
Fraser, Edward A., No. 20 College Place, New York, N. Y.
Fraser, Robert P., Water street, Pictou, Nova Scotia.
Frauer, Herman E., No. 246 East Washington street, Indianapolis, Ind.
Frazee, George B., No. 316 Curtis street, Denver, Col.
French, William B., No. 10 State street, Albany, N. Y.
Frere, Alexander G., Main street, St. Mary's Parish, Franklin, La.
Fries, Charles J. V., Main st., Anoka, Minn.
Frohwein, Richard, No. 122 First street, Elizabethport, N. J.
Frost, James, Nos. 169, 171, 173 Georgia street, Vallejo, Solano county, Cal.
Frith, Carl D. S., No. 2445 Ridge avenue, Philadelphia, Pa.
Frye, George C. No. 320 Congress street, Portland, Me.
Fuller, Henry W., No. 35 Liberty street, New York, N. Y.

Fuller, Oliver F., No. 220 Randolph street, Chicago, Ill.
Gale, Edwin O., No. 85 South Clark street, Chicago, Ill.
Gale, William H., No. 85 South Clark street, Chicago, Ill.
Gailagher, Charles K., Second street, Washington, N. C.
Gallagher, John A., Kansas City, Mo.
Galt, Edward P., No. 34 Bond street, Selma, Ala.
Gardner, Charles H., 1410 Chestnut street, Philadelphia, Pa.
Gardner, Robert W., No. 158 William street, New York, N. Y.
Garrigues, Samuel S., Ann Arbor, Mich.
Garrison, Herod D., No. 3510 Vincennes avenue, Chicago, Ill.
Gates, Amasa O., Morrisville, Vt.
Gates, Howard E., care of Wessells & Gates, Litchfield, Conn.
Gaus, Charles H., No. 202 Washington avenue, Albany, N. Y.
Gaus, Louis H., No. 254 South Pearl street, Albany, N. Y.
Gaylord, Henry C., No. 110 Monument Square, Cleveland, O.
Gegelein, Frederick L., Payne and Case avenues, Cleveland, O.
Geier, Oscar W., No. 175 Main street, Carrollton, Ky.
Genois, Louis, residence unknown.
George, Charles T., No. 1306 North Third street, Harrisburg, Pa.
Gerhard, Samuel, Hanover and Belgrade streets, Philadelphia, Pa.
Gessner, Emil A., No. 301 Chapel street, New Haven, Conn.
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Gibson, James E., Main and Markham streets, Little Rock, Ark.
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Godbold, Fabius C., No. 361 Magazine street, New Orleans, La.
Godding, Edward R., Bridge street, Eau Claire, Wis.
Godding, John G., No. 278 Dartmouth street, Boston, Mass.
Goebel, Edward, No. 530 Main street, Louisville, Ky.
Gonaux, Francois, Houma, La.
Good, James M., No. 2348 Olive street, St. Louis, Mo.
Goodale, Harvey G., Nyack, N. Y.
Goodale, Thomas T., No. 41 Central Wharf, Boston, Mass.
Goodman, Charles F., No. 180 Farnham street, Omaha, Neb.
Goodman, Emanuel, Sixth and Elm streets, Cincinnati, O.
Goodrich, Stephen, care of L. G. Moses & Co., Hartford, Conn.
Goodwin, Eugene R., Batesville, Ark.
Goodwin, Lester H., State and Main streets, Hartford, Conn.
Goodwin, William W., Newburyport, Mass.
Gordon, William J. M., No. 142 Walnut street, Cincinnati, O.
Gorgas, George A., No. 6 Market Square, Harrisburg, Pa.
Gosman, Adam J., Charles and Mulberry streets, Baltimore, Md.
Graham, Willis H., Eleventh and Olive streets, Kansas City, Mo.
Grahame, Israel J., No. 35 North Twelfth street, Philadelphia, Pa.
Grandjean, Charles. No. 2828 North Fourteenth street, St. Louis, Mo.
Grandjean, Eugene, No. 2828 North Fourteenth street, St. Louis, Mo.
Grassly, Charles W., No. 287 West Twelfth street, Chicago, Ill.
Gray, Gilbert D., Main street, between Fourth and Fifth, Glenwood, Mo.
Gray, Henry R., No. 144 St. Lawrence Main street, Montreal, Quebec, Can.
Gray, William H.. No. 1139 Market street, Wheeling, W. Va.
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Gregory, Edmund, Kent street, Lindsay, Ontario, Canada.
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Greve, Theodore L., John and Sixth streets, Cincinnati, O,

Greyer, Julius, Vine and Findlay streets, Cincinnati, O.

Griffith, Albert R., 2241 3d avenue, New York, N. Y.

Griffith, Hiram E., Grant's Block, Niagara Falls, N. Y.

Gross, Edward Z., No. 119 Market street, Harrisburg, Pa.

Grossklauss, John F., High street and Public Square, Navarre, O.

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Hadley, Frank R., No. 64 North Second street, New Bedford, Mass.

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Hahn, Sigismund J. F., No. 483 Scoville avenue, Cleveland, O.

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Hall, Charles K., 77 Tchoupitoulas street, New Orleans, La.

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Hallberg, Carl S. N., No. 69 Dearborn street, Chicago, Ill.

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Hardigg, William L., Second near Main street, Uniontown, Ky.

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Harper, Frank M., No. 45 East Main street, Madison, Ind.

Harper, Harry W., No. 514 Main street, Fort Worth, Tex.

Harrington, Frank, Werland's Block, Main street, Logan, O.

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Hartung, Hugo R., No. 230 Fifteenth street, Denver, Col.

Hartwig, Charles F., No. 476 Milwaukee avenue, Chicago, Ill.

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Haviland, Henry, New York, N. Y.

Hawkins, Henry, Hastings and Brewster streets, Detroit, Mich.

Hawkins, Joseph T., Dearborn and Minor streets, Mobile, Ala.

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Haynes, David O., 835 Jefferson avenue, Detroit, Mich.

Hays, B. Frank, No. 543 Fifth Avenue, New York, N. Y.

Hays, David, No. 207 Division street, New York, N. Y.

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Plummer, William P., No. 6 Main street, Bradford, Stark county, Ill.

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Porter, Henry C., Main and Pine streets, Towanda, Pa.

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Reiss, Edward C., No. 997 Broadway, Brooklyn, N. Y.
REMINGTON, JOSEPH P., No. 1832 Pine street, Philadelphia, Pa.
Rendigs, Charles P., Spring and Abigail streets, Cincinnati, O.
Renouff, James T., Main street, Winsted, Conn.
Renz, Frederick J., Market and Floyd streets, Louisville, Ky.
Reusch, Ernst, No. 164 Nevin street, Brooklyn, N. Y.
Reynolds, Charles E., U. S. Receiving Ship Vermont, Brooklyn, N. Y.
Reynolds, Howard P., Front and Cherry streets, Plainfield, N. J.
Reynolds, John J., Water and Main Cross streets, Flemingsburg, Ky.
Reynolds, William K., No. 354 Friendship street, Providence, R. I.
Rhoades, Stephen H., No. 88 Main street, Pittston, Pa.
Rice, Charles, Bellevue Hospital, N. York.
Rich, Willis S., Sand Bank, N. Y.
Richardson, Frank, Hudson, N. Y.
Richardson, James, No. 2827 Locust street, St. Louis, Mo.
Richardson, J. Clifford, No. 704 North Main street, St. Louis, Mo.
Richardson, William A., P. O. Box 2805, 725 Tremont street, Boston, Mass.
Rickey, Charles F., Mount Sterling, Ill.
Rickey, Randal, No. 157 North Green street, Trenton, N. J.
Ricksecker, Theodore, No. 146 William street, New York, N. Y.
Riddell, James A., Second near Main streets, Aurora, Ind.
Ridgway, Lemuel A., No. 2 Sullivan street, Mansfield, Tioga county, Pa.
Riesenman, Joseph, Liberty street, Franklin, Pa.

Riley, Charles W., 1115 Race st., Phila., Pa.
Risk, Clarence H., residence unknown.
Rittenhouse, Henry N., No. 218 North Twenty second street, Philadelphia, Pa.
Robbins, Alonzo, Eleventh and Vine streets, Philadelphia, Pa,
Robbins, Charles A., No. 91 Fulton street, New York, N. Y.
Robbins, Daniel C., No. 91 Fulton street, New York, N. Y.
Robert, Daniel J., Peabody, Kan.
Roberts, Joseph. No. 1 Greenmount avenue, Baltimore, Md.
Robertson, Archibald C., 101 Wood street, Pittsburgh, Pa.
Robin, Oscar, 249 St. Ann street, New Orleans, La.
Robinson, James S., Second and Madison streets, Memphis, Tenn.
Robinson, William S., Yorkville, Toronto, Ont., Can.
Roche, Edward M., No. 611 South Fifteenth street, Philadelphia, Pa.
Rockefeller, Lucius, Palisade avenue, Englewood, N. J.
Rogers, Arthur H., Genesee, N. Y.
Rogers, Wiley, Fifteenth and Chestnut streets, Louisville, Ky.
Rogers, William H., North street, Middletown, N. Y.
Rohde, Claus F., Spring Valley, Minn.
Rollins, John F., Fort George, Fla.
Ronnefeld, Theodore, No. 195 Gratiot avenue, Detroit, Mich.
Rose, Henry J , California.
Rosengarten, Mitchell G., Seventeenth and Fitzwater streets, Philadelphia, Pa.
Rosenwasser, Nathan, No. 112 Superior street, Cleveland, O.
Ross, Ellison H., Adrian, Mich.
Ross, William H., No. 804 Main street, Richmond, Wayne county, Ind.
Roth, Eugene N., Market street, near Green street, Thibodaux, La.
Rudolf, Mrs. Eliza, Dryades and Second streets, New Orleans, La.
Ruete, Theodore W., No. 379 Main street, Dubuque, Iowa.
Rumsey, Samuel L., No. 423 Main street, East Orange, N. J.
Runyon, Edward W., No. 529 Market street, San Francisco, Cal.
Ruppert, John, Fifth and Smith streets, Cincinnati, O.
Russell, Elias S., No. 69 Main street, Nashua, N. H.
Russell, Eugene J., Army street and Canton avenue, Baltimore, Md.
Rust, William, No. 7 Peace street, New Brunswick, N. J.
Ryerson, Henry O., No. 5 Main street, Newton, N. J.
Sander, Enno, Nineteenth and South Eleventh streets, St. Louis, Mo.
Sanderson, Stephen Francis, Rochester, N. Y.
Sands, George G., No. 4 Vanderbilt avenue, New York, N. Y.
Sargent, Ezekiel H., No. 125 State street, Chicago, Ill.
Sauer, Louis W., Central avenue and Baymiller street, Cincinnati, O.
Sauerhering, Rudolph A., Main street, Mayville, Dodge county, Wis.
Saunders, Richard B., Chapel Hill, N. C.
Saunders, William, Central Experiment Farm, Ottawa, Ont., Can.
Sautter, Louis, South Pearl and Plain streets, Albany, N. Y.
Sawyer, William F., 1152 Tremont street, Boston, Mass.
Sayre, Edward A., No. 183 Littleton avenue, Newark, N. J.
Sayre, Lucius E., University of Kansas, Lawrence, Kan.
Sayre, William H., Warner and Orange streets, Newark, N. J.
Schaaf, Justus H., No. 442 Second street, Gallipolis, O.
Schafer, George H., Nos. 14 and 16 Front street, Fort Madison, Iowa.
Schafhirt, Adolph J., First and H streets, Washington, D. C.
Schambs, George M., Park Pharmacy, Cleveland, O.
Scheffer, Emil, No. 145 Market street, Louisville, Ky.
Scheffer, Henry W , No. 218 Clark avenue, St. Louis, Mo.
Schellentrager, E. A., No. 725 St. Clair street, Cleveland, O.
Scherer, Andrew, No. 381 East Division street, Chicago, Ill.

Scherff, John P., Glenwood avenue and Washington street, Bloomfield, N. J.

Scherling, Gustav, Sioux City, Ia.

Schermerhorn, Winfield S., Main street, Stillwater, Saratoga county, N. Y.

Schiemann, Edward B., M and Walnut streets, Louisville, Ky.

Schlaepfer, Henry J., Main and Second streets, Evansville, Ind.

Schley, Steiner, No. 16 West Patrick street, Frederick City, Md.

Schmid, Henry, No. 38 Avenue A, New York. N. Y.

Schmidt, Ferdinand T., 467 Ninth avenue, New York, N. Y.

Schmidt, Florian C., Fulton avenue and Franklin street, Evansville, Ind.

Schmidt, Frederick M., No. 95 Fifth avenue, Chicago, Ill.

Schmidt, Valentine, 1300 Polk street, San Francisco, Cal.

Schmitt, Joseph M., No. 302 North avenue, Rochester, N. Y.

Schneider, Matthias M., No. 327 Carson street, Pittsburgh, Pa.

Schoettlin, Albert J.. No. 301 West Broadway, Louisville, Ky.

Scholtz, Edmund L., Sixteenth and Stout streets, Denver, Col.

Schrader, Henry, No. 74 East Washington street, Indianapolis, Ind.

Schranck, C. Henry, Nos. 437 and 439 East Water street, Milwaukee, Wis.

Schreck, Leo S., Liberty and John streets, Cincinnati. O.

Schueller, Ernst, No. 231 South High street. Columbus, O.

Schueller, Frederick W., Nos. 190 and 192 South High street, Columbus, O.

Schumann, Theodore. Whitehall and Hunter streets, Atlanta, Ga.

Schofield, James S., Ninth avenue and Fifty seventh street, New York, N. Y.

Scott, George T., Franklin Square, Worcester, Mass.

Scott, Nelson R., Main and Southbridge streets, Worcester, Mass.

Scott, William H., No. 1617 Seventeenth street, Richmond, Va.

Scott, Wm. J., 257 Prospect st., Cleveland, O.

Scoville, Charles H., opposite the Lock, Tonawanda, Erie county, N. Y.

Seabury, George J., No. 21 Platt street, New York, N. Y.

Searby, William M., No. 859 Market street, San Francisco, Cal.

Sedberry, Bond E., Market Square, Fayetteville, N. C.

Seitz, Oscar, No. 107 Santa Fe ave., Salina, Kan.

Senior, Frederick S., No. 1164 Humboldt avenue, Milwaukee, Wis.

Sennewald, Ferdinand W., No. 800 Hickory street, St. Louis, Mo.

Serodino, Herman, 53 Observatory street, Cincinnati, O.

Sevin, N. Douglas, No. 141 Main street, Norwich, Conn.

Sewall, David J., 1439 Dorchester avenue, Boston, Mass.

Seykora, Edward J., North Bend, Neb.

Sharp, Alpheus P., Pratt and Howard sts., Baltimore, Md.

Sharples, Stephen P., No. 13 Broad street, Boston, Mass.

Shaw, Robert J., No. 3 East Front street, Plainfleld, N. J.

Shedd, Edwin W., No. 39 Tremont street, Boston, Mass.

Sheils, George E., No. 896 Broadway, New York, N. Y.

SHEPPARD, SAMUEL A. D., No. 1129 Washington street, Boston, Mass.

Sherwood, Louis W., No. 31 West Broad street, Columbus, O.

Shinn, James T., Broad and Spruce streets, Philadelphia, Pa,

Shivers, Charles, Seventh and Spruce sts., Philadelphia, Pa.

Shoemaker. Richard M., Fourth and Race streets, Philadelphia, Pa.

Shorb, J. Eagan, No. 108 North Main street, St. Louis, Mo.

Shrader, John L., Michigan City, Ind.

Shreve, John A., Main street, Port Gibson, Miss.

Shriver, Henry, No. 53 Baltimore street, Cumberland, Md.

Shryer, Thomas W., No. 103 Baltimore street, Cumberland, Md.

Shurtleff, Israel H., No. 39 Elm street, New Bedford, Mass.

Siegemund, Charles A., No. 1553 Washington street, Boston, Mass.

Siegenthaler, Harvey N., No. 55 East Main street, Springfield, O.
Simmon, Karl, Third and Market streets, St. Paul, Minn.
Simms, Giles G. C., No. 1344 New York avenue, Washington, D. C.
Simon, William, 10 Block st., Baltimore, Md.
Simonson, William, Seventh and Elm streets, Cincinnati, O.
Simpson, William, No. 33 Fayetteville st., Raleigh, N. C.
Simpson, William, No. 609 Davis street, San Francisco, Cal.
Simson, Francis C., Halifax, N. S.
Sitton, Charles E., No. 151 First street, Portland, Oregon.
Skelly, James Jos., No. 339 East Fourteenth street, New York, N. Y.
Slater, Frank H., Main street, Mattawan, Monmouth county, N. J.
Sloan, George W., No 22 West Washington street, Indianapolis, Ind.
Slocum, Frank L., No. 170 Rebecca street, Allegheny. Pa.
Slosson, Frank W., No. 223 Superior street, Cleveland, O.
Slosson, George, Coffeyville, Kan.
Smink, William H. R., 33 Market street, Shamokin, Pa.
Smith, Charles B., No. 861 Broad street, Newark, N. J.
Smith, Edward N., No. 95 Main street, Thompsonville, Hartford county, Conn.
Smith, Israel P., No. 324 Bank street, Newark, N. J.
Smith, J. Hungerford, firm Smith & Prince, Au Sable Forks, N. Y.
Smith, Joseph S., No. 193 S. Howard street, Akron, O.
Smith, Linton, Seventh and Market streets, Wilmington, Del.
Smith, S. Douglas, No. 526 Penn street, Reading, Pa.
Smith, Willard, No. 20 W. Main street, Rochester, N. Y.
Smith, Willard A., Main street, Richfield Springs, N. Y.
Smithnight, Albert, No. 135 Woodland avenue, Cleveland, O.
Sniteman, Charles C., Neillsville, Wis.
Snively, Andrew J., Centre Square, Hanover, York county, Pa.
Snow, Charles W., No. 28 East Genesee street. Syracuse, N. Y.
Snow, Herbert W., care of Fred. Stearns & Co., Detroit, Mich.
Snyder, Alva L., No. 33 Court Square, Bryan, O.
Snyder, Ambrose C., No. 13½ St. Felix street, Brooklyn, N. Y.
Snyder, Robert J., Second and Market streets, Louisville, Ky.
Sombart, John E., Coldwater, Kan.
Somers, Frank G., No. 125 State street, Chicago, Ill.
Spalding, Warren A., No. 19 Church street, New Haven, Conn.
Spannagel, Charles C., No. 1607 Ridge avenue, Philadelphia, Pa.
Spears, Jacob V., Kissimmee, Fla.
Spenzer, Peter I., No. 88 Garden street, Cleveland, O.
Sperry, Herman J., No. 151 Chapel street, New Haven, Conn.
Spofford, Charles B., No. 12 Tremont street, Claremont, N. H.
Squibb, Edward H., No. 36 Doughty street, Brooklyn, N. Y.
Squibb, Edward R., No. 36 Doughty street, Brooklyn, N. Y.
Stacey, Benjamin F., Thompson Square, Charlestown, Mass.
Stahler, William, Main and Swedes streets, Norristown, Pa.
Stahlhuth, Ernst H. W., 24 Melanchthon street, Cincinnati, O.
Staley, Michael C., No. 444 Virginia avenue, Indianapolis, Ind.
Stam, Colin A., Chestertown, Md.
Stamford, William H., No. 256 Mulberry street, Newark, N. J.
Stanford, William A., No. 413 Main street, Florence, Kan.
Stanley, E. C., 97 Franklin st., Auburn, N. Y.
Starr, Thomas, No. 313 Ninth avenue, New York, N. Y.
Steele, Henry, Turk and Taylor streets, San Francisco, Cal.
Steele, James G., No. 635 Market street, San Francisco, Cal.
Stein, Jacob H., No. 803 Penn street, Reading, Pa.
Steinhauer, Frederick, No. 381 Lorimer street, Denver, Col.

Stevens, Alonzo B., University of Michigan, Ann Arbor, Mich.

Stevens. S. Henry, No. 627 Copeland street, Pittsburgh, Pa.

Stevens, Luther F., Atlantic avenue and Court street, Brooklyn, N. Y.

Stewart, Francis E., No. 1206 Delaware avenue, Wilmington, Del.

Stierle, Adolph, No. 302 East Seventh street, St. Paul, Minn.

Stollenwerck, Alphonse L., Birmingham, Ala.

Stone, Clarence G., No. 580 Lafayette avenue, Detroit, Mich.

Stowell, Daniel, No. 1045 Washington street, Boston, Mass.

Strachan, William E., No. 619 Third avenue, Brooklyn, N. Y.

Strassel, William, cor. Shelby street and Broadway, Louisville, Ky.

Stryker, Cornelius W.. No. 1233 Walnut street, Philadelphia, Pa.

Sutton, Peter P., Deland, Fla.

Sweeny, Robert O., St. Paul, Minn.

Sweet, Abel S., Jr., 2 Main st., Bangor, Me.

Sweet, Caldwell, No. 22 W. Market Square, Bangor, Me.

Sweet, Frederick K., No. 2 Main street, Lockport, N. Y.

Sweet, William S., No. 44 Main street, Warsaw, N. Y.

Tartis, Alfred J., No. 268 Putnam avenue, Brooklyn, N. Y.

Taylor, Alfred B, No. 262 South Twelfth street, Philadelphia, Pa.

Taylor, James H., No. 104 Thames street, Newport, R. I.

Taylor, John P., No. 99 Third street, New Bedford, Mass.

Test, Alfred W., Second and Federal streets, Camden, N. J.

Thackeray, William T., Hotel St. Benedict, Room 9, Chicago, Ill.

Thatcher, Joseph H., No. 12 Market street, Portsmouth, N. H.

Thatcher, Hervey D., No. 12 Market Square, Potsdam, N. Y.

Thibodeaux, Joseph G., Main street, Thibodeaux, La.

Thomas, George M., Derry Station, Pa.

Thomas, James, Jr., opposite Maxwell House, Nashville, Tenn.

Thomas, Oscar E., No. 154 Main street, Columbia, S. C.

Thompson, Edward W., No. 181 Main street, New Britain, Conn.

Thompson, William B., No. 1700 Mount Vernon street, Philadelphia, Pa.

Thompson, William S., No 703 Fifteenth street, Washington, D. C.

Thompson, William S., No. 5 West Baltimore street, Baltimore, Md.

Thomsen, John J., Nos. 14 and 16 German street, Baltimore, Md.

Thomsen, John J., Jr., No. 18 McCulloh street, Baltimore, Md.

Thorn, Henry P., Main street, Medford, N. J.

Thurber, Almon R., No. 216 F street, Salida, Col.

Thurston, Azor, Grand Rapids, Wood county, O.

Tiarks, Hermann, First street, Monticello, Ia.

Tibbs, William H , Grand Rapids, Mich.

Tiernan, Frank M., Mansion House, Roselle, N. J.

Tilyard, Charles S., Greene and Franklin streets, Baltimore, Md.

Tindall, Graham McF., No. 61 Commercial street, Aberdeen, Miss.

Tobey, Charles W., No. 302 Market street, Troy, O.

Tobin, James M., Montclair, N. J.

Todd, Albert M., Nottowa, St. Joseph county, Mich.

Todd, William J., No. 71 Franklin street, Pittsburgh, Pa.

Tomfohrde, John W., Benton and Twenty-second streets, St. Louis, Mo.

Tooker, William W., No. 70 Main street, Sag Harbor, N. Y.

Topley, James, No. 166 Georgia street, Vallejo, Solano county, Cal.

Torbert, Willard H., No. 756 Main street, Dubuque, Ia.

Toulson, Melbourn A., High street, Chestertown, Md.

Tower, Levi, Jr., Boylston and Clarendon streets, Boston, Mass.

Townsend, Abram R., S. M. Stephenson Hotel, Menominee, Mich.

Trask, Charles M., White River Junction, Vt.

Treat, Joseph A , Stuart, Ia.
Trimble, Henry, No. 145 North Tenth street, Philadelphia, Pa.
Truax, Charles, No. 81 Randolph street, Chicago, Ill.
Tscheppe, Adolph, No. 1010 Third avenue, New York, N. Y.
TUFTS, CHARLES A., No. 25 Washington street, Dover, N. H.
Turner, George H., No. 296 South Pearl street, Albany, N. Y.
Turner, Isaac W., No. 139 Wayne street, Jersey City, N. J.
Turner, T. Larkin, No. 3 Ashburton Place, Boston, Mass.
Tuska, David, Second avenue and Eighty-sixth street, New York, N. Y.
Ubert, Julius C., Lee and Division streets, Brooklyn, N. Y.
Ude, George, No. 3610 N. Tenth street, St. Louis, Mo.
Uhlich, Ferdinand G., No. 1401 Salisbury street, St. Louis, Mo.
Underhill, Joseph G., No. 397 Classon avenue, Brooklyn, N. Y.
Upson, Rosa, Marshalltown, Ia.
Urban, Jacob P., No. 336 Ontario street, Cleveland, O.
Van Antwerp, Garet, No. 71 Dauphin street, Mobile, Ala.
Van Auken, Jerrie A., No. 125 Main street, Gloversville, N. Y.
Vandegrift, John A., No. 320 High street, Burlington, N. J.
Van Winkle, Abraham W., No. 35 Clinton avenue, Newark, N. J.
Vaughan, Parry W , Main street, Durham, Orange county, N. C.
Vernor, James, No. 235 Woodward avenue, Detroit, Mich.
Viallon, Paul L., Park and Front streets, Bayou Goula, La.
Vilter, Herman, McMicken avenue and Locust street, Cincinnati, O.
Vincent, Lorren S., No. 200 Brown street, Dayton, O.
Vordick, August H., Jefferson avenue and Benton street, St. Louis, Mo.
Voss, George W., Eighth and Depot streets, Cincinnati, O.
Wackerbarth, John, No. 179 Sands street, Brooklyn, N. Y.
Wagner, Henry, Ninth and Linne streets, Cincinnati, O.
Wahmhoff, Julius H., No. 14 Canal street, Delphos, O.
Walbrach, Arthur, No. 230 Fifteenth street, Denver, Col.
Walch. Robert H., No. 1412 Walnut street, Philadelphia, Pa.
Walker, Anselle, Main street, Freehold, N. J.
Walker, Charles, No. 201 Third street, Hannibal, Mo.
Walker, Francis W., Jr., New Brighton, Pa.
Walker, George T., Pittsburg, Crawford county, Kan.
Walker, John P., Main street, Freehold, N. J.
Walker, William J., No. 74 State street, Albany, N. Y.
Wall, Otto A., No. 2111 Columbus street, St. Louis, Mo.
Walling, Walter A., No. 180 Charles street, Providence, R. I.
Walton, Harry C., Laurel and Cutter streets, Cincinnati, O.
Walton, Joseph R., Washington, D. C.
Wangler, Conrad D., 61 and 63 East Fourth street, Eastside, Waterloo, Ia.
Wanier, George S., No. 407 Eighth avenue, New York, N. Y.
Ward, Benjamin, Dauphin and Conception streets, Mobile, Ala.
Wardell, Robert C., Battle Creek, Mich.
Warn, William E., First st., Keyport, N. J.
Warne, Henry L., Main street, Mitchell, Dak. Ter.
Warner, William R., No. 1228 Market street, Philadelphia, Pa.
Warren, Edwin A., No. 360 Sibley street, St. Paul, Minn.
Watjen, Herman J., Vincennes, Ind.
Watson, Sidney P., Jacksonville, Fla.
Watson, William H., College and Line streets, Nashville, Tenn.
Waugh, George J., Ontario street, Stratford, Ont., Can.
Weaver, Charles A., Fifth and Walnut streets, Des Moines, Ia.
Weaver, John A., No. 334 Northampton street, Easton, Pa.
Webb, John A., No. 210 Madison avenue, Baltimore, Md.

Webb, William H., No. 556 North Sixteenth street, Philadelphia, Pa.

Webber, J. Le Roy, care of Parke, Davis & Co., Detroit, Mich.

Weber, William, Fifteenth and Thompson streets, Philadelphia, Pa.

Wehrly, Thomas M., No. 72 G street N. W., Washington, D. C.

Weichsel, Franz, cor. Main street and Michigan avenue, La Porte, Ind.

Weidemann, Charles A., No. 2148 Green street, Philadelphia, Pa.

Weills, William M. L., No. 332 Broad street, Harrisburg, Pa.

Weinman, Oscar C., No. 173 Seventh avenue, New York, N. Y.

Weiser, Albert, Preston, Minn.

Weiser, Emilius I., No. 5 Water street, Decorah, Ia.

Welch, Leonard E., Broad and Washington streets, Albany, Ga.

Wellcome, Henry S., No. 8 Snow Hill, London, England.

Wellington, Arthur W., 190 Cranston street, Providence, R. I.

Wells, Ebenezer M., Houston street, Fort Worth, Texas.

Wells, Jacob D., Fourth street and Central avenue, Cincinnati, O.

Wells, Romanta, No. 297 State street, New Haven, Conn.

Wendell, Henry E., Third and George streets, Philadelphia, Pa.

Wenzell, William T., No. 532 Market street, San Francisco, Cal.

West, Howell F., Main street, Fayette, Miss.

Westmann, F. H., No. 2744 Cass avenue, St. Louis, Mo.

Weusthoff, Otto S., No. 212 East Third street, Dayton, O.

Weyer, John, Elm and Sixth streets, Cincinnati, O.

Whall, Joseph S., No. 82 Hancock street, Quincy, Mass.

Wharton, John C., No. 38 Union street, Nashville, Tenn.

Wharton, William H., No. 38 Union street, Nashville, Tenn.

Wheeler, Leonard H., No. 78 State street, Albany, N. Y.

Wheeler, Lucien F., Waldo, Fla.

Whelpley, Henry M., No. 510 Pine street, St. Louis, Mo.

WHITE, AARON S., No. 59 High street, Mt. Holly, N. J.

White, George H., Newark and Jersey avenues, Jersey City, N. J.

WHITFIELD, THOMAS, No. 240 Wabash avenue, Chicago, Ill.

Whiting, Frederick T., Main street, Great Barrington, Mass.

Whitman, Nelson S., No. 3 Merchants' Exchange, Nashua, N. H.

Whitney, Henry M., No. 29 Essex street, Lawrence, Mass.

Wichelus, Frederick, No. 192 Greenwich street, New York, N. Y.

Wickham, William H., No. 91 Fulton street, New York, N. Y.

Wiegand, Thomas S., No. 4 South Thirty-eighth street, Philadelphia, Pa.

Wienges, Conrad, No. 649 Jersey avenue, Jersey City, N. J.

Wight, Oscar M., Lexington street, Independence, Mo.

Wilcox, Frederick, Apothecaries' Hall, Exchange Place, Waterbury, Conn.

Wiley, Goodwin R., Main street, Bethel, Me.

Williams, Alfred N., No. 93 Market street, Parkersburg, W. Va.

Williams, Doane B., No. 16 Lincoln square, Worcester, Mass.

Williams, John K., No. 391 Main street, Hartford, Conn.

Williams, Richard W., Notre Dame street, Three Rivers, Quebec, Can.

Williams, Seward W., No. 2184 Fifth avenue, New York, N. Y.

Williams, William H., No. 659 Main street, Wheeling, W. Va.

Wilson, Albert H., Penn street and Frankstown avenue, Pittsburgh, Pa.

Wilson, Benjamin O., No. 28 Merchants' Row, Boston, Mass.

Wilson, Frank M., No. 133 Main street, Willimantic, Conn.

Wilson, Julius H., No. 125 Twenty-second street, Chicago, Ill.

Wilson, William, No. 106 Broadway, cor. Pine street, New York, N. Y.

WINKLEMAN, JOHN H., Liberty and German streets, Baltimore, Md.

Winslow, Edwin C., No. 107 Main street, Danville, Ill.
Winter, Jonas, No. 81 West Franklin street, Hagerstown, Md.
Wiseman, Henry A., Main street, Danville, Va.
Wohlfarth, Justin, No. 2002 Third avenue, New York, N. Y.
Wolfe, Nathaniel, No. 213 Market street, Wilkesbarre, Pa.
Woltersdorf, Louis, No. 171 Blue Island avenue, Chicago, Ill.
Wood, Edward S., No. 14 Chauncey street, Cambridge, Mass.
Wood, Mason B., Taunton avenue and Valley street, East Providence, R. I.
Woodbridge, George W., No. 160 State street, Boston, Mass.
Woodruff, Roderick S., No. 91 Blank street, Waterbury, Conn.
Wooldridge, Napoleon, Cedar Key, Fla.
Wright, Archibald W, Front and Market streets, Philadelphia, Pa.
Wright, Edward E., No. 24 Sycamore street, New Bedford, Mass.
Wynn, William, No. 496 Fulton street, Brooklyn, N. Y.
Yatman, John L., Orange Valley, N. J.
Yeakel, Nathan W., Nos. 107 and 109 Columbia street, Lafayette, Ind.
Yorston, Matthew M., No. 429 Central avenue, Cincinnati, O.
Young, Alexander T., No. 103 Sixteenth street, Wheeling, W. Va.
Young, John K., P. O. Box 235, Bristol, Pa.
Young, Judson J., No. 11 Freeman street, Kansas City, Mo.
Young, William, 114 Park avenue, Rich Hill, Mo.
Zahn, Emil A., No. 1801 State street, Chicago, Ill.
Zeilin, John H., No. 306 Cherry street, Philadelphia, Pa.
Zeller, William S., No. 14 Brinkerhoff Row, Bellefonte, Centre county, Pa.
Zellhœfer, George, No. 225 South 4th street, Brooklyn, N. Y.
Ziegler, Philip M., No. 526 Penn street, Reading, Pa.
Zimmerman, Charles, No. 423 S. Adams street, Peoria, Ill.
Zimmerman, John L., Bridge street, Las Vegas, New Mexico.
Zoeller, Edward V., Main street, Tarboro, N. C.
Zuenkeler, John F., 686 Vine street, Cincinnati, O.
Zwick, George A., Eleventh street, and Madison avenue, Covington, Ky.

ADDITIONAL LIST OF NEW MEMBERS.

The following gentlemen made application under the old By-laws, but were elected after the amended By-laws had been adopted; the names should have been printed on page 641.

Randolph F. Bryant, Lincoln, Kan.
Thurston B. Duncan, Mexico, Mo.
Charles M. Ford, Denver, Col.
James E. Gibson, Little Rock, Ark.
Julius Hoffman, Cincinnati, O.
John Homer, Newburyport, Mass.
Lucius Rascoe, Nashville, Tenn.
Lorren S. Vincent, Dayton, O.
Sidney P. Watson, Jacksonville, Fla.

Valentine Schmidt, San Francisco, Cal., has become a member by invitation and signing the Constitution and By-Laws.

LIST OF RESIGNATIONS.

Charles B. Allaire, Peoria, Ill.
[2] Alvin B. Armstrong, Smethport, Pa.
[3] John W. Bassett, Tompkinsville, N. Y.
[2] Charles Becker, Washington, D. C.
[2] Henry Bodeker, Richmond, Va.
[2] Albert J. Broughton, Rome, N. Y.
[2] Robert H. Cowdrey, Chicago, Ill.
[2] David P. Cox, Terre Haute, Ind.
[2] Edwin Eareckson, Baltimore, Md.
[2] George W. French, Boston, Mass.
[2] Edward G. Frothingham, Haverhill, Mass.
[2] Max Gessler, Milwaukee, Wis.
[2] John R. Gorham, Newburgh, N. Y.
[3] Dominicus Hanson, Rochester, N. Y.
[2] William H. Harbers, Aiken, S. C.
[1] Frank L. Harwood, Warren, Mass.
[1] Charles W. Helman, Cincinnati, O.
[1] Henry W. Heuermann, Chicago, Ill.
[1] Charles H. Hobart, New York, N. Y.
[2] Charles M. Hostetter, Pittsburgh, Pa.
Huber, Jacob C., Fond du Lac, Wis.
[2] John Hurley, Little Falls, N. Y.
[2] James F. Hurt, Columbia, Mo.
[2] John H. B. Jefferson, Baltimore, Md.
[1] Benj. F. Johnson, Philadelphia, Pa.
[2] Horace J. Johnson, Waltham, Mass.
[2] Louis Keiper, Cleveland, O.
[3] Thomas Kennedy, New Brighton, Pa.
[2] Robert M. Kuerze, Cincinnati, O.
[2] Robert Lautenbach, Baltimore, Md.
[3] Samuel E. Lewis, Washington, D. C.
[1] George Y. Miller, Luzerne, N. Y.
[1] William T. Milliner, Spencerport, N. Y.
[1] James S. Moore, West Stockbridge, Mass.
[2] William W. Moorhead, Philadelphia, Pa.
Frederick Nick, Erie, Pa.
[2] Alonzo T. Pinkham, Dover, N. H.
[2] John B. Purcell, Richmond, Va.
[1] Lucien M. Royce, New York, N. Y.
[2] Edward W. Russell, Baltimore, Md.
Richard Sappington, Baltimore, Md.
[2] Thomas J. Savage, Mobile, Ala.
[1] Samuel W. W. Schaffle, Lewisburg, Pa.
[2] August Schreiber, Tell City, Ind.
Herman Schroeder, Quincy, Ill.
[2] Edward E. Shead, Eastport, Me.
[2] Jesse W. Snow, Boston, Mass.
[2] William P. Thompson, Baltimore, Md.
[2] Abner Thorp, Avondale, O.
[2] William M. Townley, Newark, N. J.
[3] John H. Twombley, New Market, N. H.
[2] George F. Underhill, Concord, N. H.
[1] Philip A. White, New York, N. Y.
[3] Carl R. Wigert, Burlington, Ia.
[2] Edward J. Williamson, St. Louis, Mo.
[3] Samuel W. Winslow, Boston, Mass.
[3] Lawrence Wolff, Philadelphia, Pa.
[1] Theodore J. Wrampelmeier, San Diego, Cal.
[2] Max R. Zaegel, Sheboygan, Wis.

LIST OF RESIGNED MEMBERS, WHO HAVE PAID 1887 DUES AND HENCE ARE ENTITLED TO 1887 PROCEEDINGS.

Charles B. Allaire, Peoria, Ill.
Charles Becker, Washington, D. C.
George W. French, Boston, Mass.
William H. Harbers, Aiken, S. C.
Charles H. Hobart, New York, N. Y.
John Hurley, Little Falls, N. Y.
William T. Milliner, Spencerport, N. Y.
John B. Purcell, Richmond, Va.
Lucien M. Royce, New York, N. Y.
John H. Twombley, New Market, N. H.

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[1] Inability to attend the meetings. [2] No reason given. [3] Left the business.

LIST OF DECEASED MEMBERS.

Since the last meeting notice of the death of the following members has been received:

James Bowker,	Philadelphia, Pa.	Elected 1876
Robert F. Latimer,	Jackson, Mich.	" 1857
Henry W. Lincoln,	Charlestown, Mass.	" 1853
George D. Randall,	St. Johnsbury, Vt.	" 1875
Randal Rickey,	Trenton, N. J.	" 1870
Joseph T. Webber,	Springfield, Mass.	" 1873

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